C21.5 : 944/3

Vol. 944 Number 3

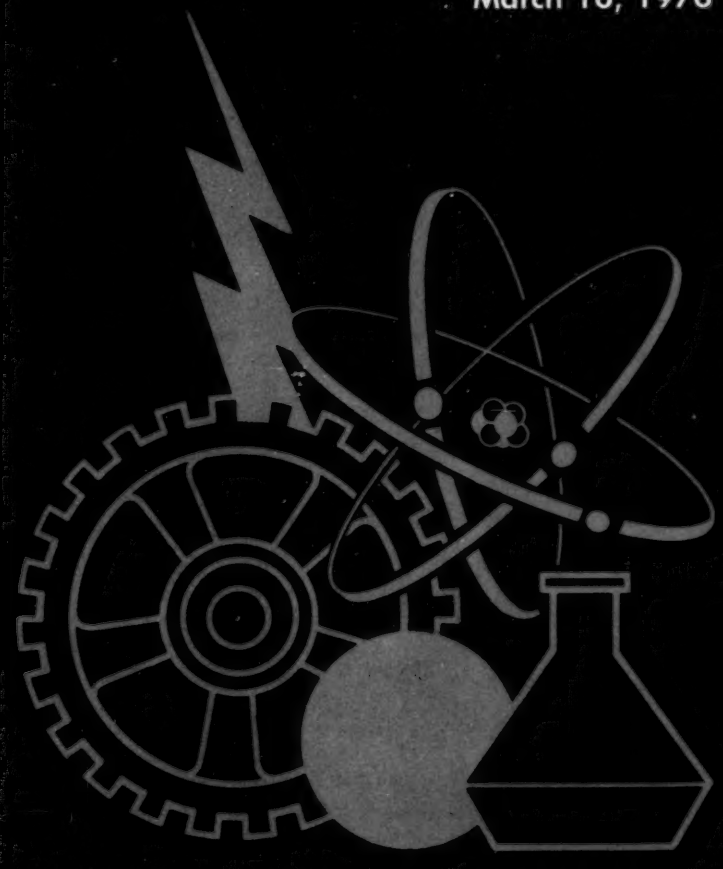
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

March 16, 1976



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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

March 16, 1976 Volume 944 Number 3

CONTENTS

	Page
Patent and Trademark Notices	
Interference Practice	1006
Patent Suits	1007
Second Trial Voluntary Protest Program	1007
Patent Notices	
Certificates of Correction for the Week of March 16, 1976	1009
Dedications	1009
Disclaimers	1009
National Technical Information Service	1010
Condition of Patent Applications	1013
Patent Applications Published Under Second Trial Voluntary Protest Program	
General and Mechanical	1015
Chemical	1032
Electrical	1045
Design Patent Applications Published Under Second Trial Voluntary Protest Program	1056
Reissue Patents Granted (28,735)	1059
Plant Patents Granted (3,841)	1061
Patents Granted	
General and Mechanical (3,943,571)	1063
Chemical (3,944,382)	1332
Electrical (3,944,713)	1422
Design Patents Granted (239,145)	1532
Index of Applicants and Assignees of Published Applications	PI 1
Classification of Published Patent Applications	PI 5
Index of Patentees	PI 13
Cross Reference of Published Patent Applications Published Under Trial Voluntary Protest Program	PI 57
Index of Reissue Patentees	PI 61
Index of Plant Patentees	PI 61
Index of Design Applicants and Assignees of Design Applications	PI 61
Classification of Published Design Applications	PI 62
Index of Design Patenteees	PI 62
Classification of	
Patents (Including Reissues)	PI 65
Designs and Plants	PI 68
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 69
Designs and Plants	PI 71

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PATENT AND TRADEMARK OFFICE NOTICES

Interference Practice

[37 CFR Part 1]

Proposed Rulemaking

Notice is hereby given that, pursuant to the authority contained in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6) as amended on October 5, 1971 (Public Law 92–132, 85 Stat. 364), the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by amending Sections 1.228, 1.243, 1.244, 1.254 and 1.256.

All persons are invited to present their views, objections, recommendations or suggestions relating to the proposed rule changes to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 on or before March 26, 1976. All comments received will be available for public inspection in Room 11E10 of Building 3, at 2021 Jefferson Davis Highway, Arlington, Virginia. No oral hearing will be held.

This proposal has been reviewed pursuant to E.O. 11821 and OMB Circular A–107 and determined to have no major inflationary impact.

These rule changes are intended to clarify the current practice before the Board of Patent Interferences and to correct several inconsistencies in rule language. The rule changes: (1) provide for time for oral arguments with respect to oral hearing under § 1.228, (2) shift matter relating to motions before the Board of Patent Interferences from § 1.244 to § 1.243, (3) establish § 1.244 under a separate heading dealing with petitions to the Commissioner and (4) amplify requirements relating to briefs at final hearing as well as oral arguments presented at final hearings.

It is proposed to amend 37 CFR, Chapter 1, as follows:

1. By revising § 1.228 to read as follows:

§ 1.228 *Summary judgment.*

When an interference is declared on the basis of a showing under § 1.204(c), such showing will be examined by an examiner of interferences. If the examiner considers that the facts set out in the showing provide sufficient basis for the interference to proceed, the interference will proceed in the normal manner as provided by the regulations in this part; otherwise an order shall be entered concurrently with the notice of interference pointing out wherein the showing is insufficient and notifying the applicant making such showing that summary judgment will be rendered against him because of such insufficiency at the expiration of a period specified in the notice, not less than 30 days, unless cause be shown why such action should not be taken. In the absence of a showing of good and sufficient cause, judgment shall be so rendered. Any response made during the specified period will be considered by a Board of Patent Interferences without an oral hearing unless such hearing is requested by the applicant, but additional affidavits, declarations, or exhibits will not be considered unless accompanied by a showing in excuse of their omission from the original showing. If the applicant files a response to the order to show cause, the patentee will be furnished with one copy of the showing under § 1.204(c) and will be allowed not less than 30 days from its mailing date within which to present his views with respect thereto. He shall also be entitled to be represented at any oral hearing on the matter. Unless it shall be otherwise ordered before the hearing begins, oral arguments will be limited to not more than 30 minutes for each party. The Board will determine, on the basis of the original showing and the response made, whether the interference should be allowed to proceed or summary judgment should be entered against the junior applicant.

2. By revising § 1.243 to read as follows:

§ 1.243 *Motions before the Board of Patent Interferences.*

(a) Motions relating to matters other than those specified in § 1.231 will be determined by a patent interference examiner or the Board of Patent Interferences, as may be deemed appropriate. Such motions shall be made in writing and shall contain a full statement of the action sought and the grounds therefor, and satisfactory proof of any facts required must accompany the motion. Oral hearings will not be held except on order of a patent interference examiner or Board of Patent Interferences. Briefs or memoranda in support of such motions shall accompany the motion. Any opposition to the motion, together with any brief or memorandum in support thereof, shall be filed within 20 days from the date of service of the motion unless some other date is set by the patent interference examiner.

(b) Typewritten briefs may be used in connection with all motions. By stipulation of the parties subject to approval or by order of the tribunal before whom the motion is pending, briefs may be received if filed otherwise than as prescribed.

(c) In oral hearings on motions, the moving parties shall have the right to make the opening and closing arguments. Unless otherwise ordered before the hearing begins, oral arguments will be limited to 30 minutes for each party.

(d) Any request for reconsideration or modification of a decision or other action by the Board of Patent Interferences or patent interference examiner must be filed within 20 days after the date of the decision or other action and any reply thereto must be filed within 20 days from the date of service of the request. With regard to requests for reconsideration of a decision after final hearing, see § 1.256(b).

3. By revising § 1.244 to read as follows:

§ 1.244 *Petitions to the Commissioner from decisions on motions.*

There is no appeal from decisions rendered on motions, but the Commissioner may consider on petition any matter involving abuse of discretion or the exercise of his supervisory authority, or such other matters as he may deem proper to consider. Any such petition must comply with § 1.181 and, if not filed within 20 days from the decision complained of, may be dismissed as untimely. Any opposition thereto must be filed within 20 days from the date of service of the petition.

4. By revising § 1.254 to read as follows:

§ 1.254 *Briefs at final hearing.*

Briefs at final hearing before the Board of Patent Interferences shall be submitted in printed form, except that when not in excess of 50 legal-size double-spaced typewritten pages, or the equivalent thereof, and in any other case where satisfactory reason therefor is shown, they may be submitted in typewritten form. If submitted in printed form, they shall be the same in size and the same as to page and print as is specified for printed copies of testimony. Typewritten briefs shall conform to the requirements for typewritten copies of testimony, except that legal-size paper may be used and the binding and covers specified are not required. Every brief of more than 15 pages shall contain a subject index with page references, supplemented by a list of all authorities referred to, together with references to pages thereof. Three copies of each brief must be filed. The times for filing briefs will be set at an appropriate stage in the proceeding prior to final hearing. The brief for the junior party shall present a full, fair statement of the questions involved, including his position with respect to the case presented on behalf of other parties, and a clear statement of the points of law or fact on which he relies. The main brief for each party shall contain a copy of the counts in interference.

5. By revising § 1.256 to read as follows:

§ 1.256 *Final hearing.*

(a) Final hearings will be held by the Board of Patent Interferences on the day appointed at the designated time. If either party appears at the proper time, he will be heard. After the day of hearing, the case will not be taken up for oral argument except by consent of all parties. If the Board of Patent Interferences be prevented from hearing the case at the time specified, a new assignment will be made, or the case will be continued from day to day until heard. Unless it shall be otherwise ordered before the hearing begins, oral arguments will be limited to not more than one hour for each party. A junior party may reserve a portion of his time for rebuttal purposes, but a full, fair opening of his case must be made, including his position with respect to the case presented on behalf of other parties. After a contested case has been argued, nothing further relating thereto will be heard unless upon request of the Board of Patent Interferences.

(b) Any request for rehearing or reconsideration, or modification of the decision after final hearing, must be filed within 30 days from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision,

and the Board of Patent Interferences so states. Any reply thereto must be filed within 15 days from the filing of the request. The times specified herein may be extended by the Board of Patent Interferences upon a showing of sufficient cause. (See § 1.304.)

Dated: February 10, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved:

DAVID B. CHANG,
Deputy Assistant Secretary for Science and Technology.

[FR Doc. 76-4773; Filed 2-18-76; 8:45 am]

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,734,028, B. Domogalla, KILLING ALGAE IN WATER WITH COPPER ALKANOLAMINE SALTS, **filed** July 25, 1972, D.C., E.D. Wis. (Milwaukee), Doc. 72-C-429, *Applied Biochemists, Inc., Donald E. Seymour and Donald H. Kunkel* v. *A. and V. Inc., Keith M. Anderson, Marjorie E. Vetter and Dennis L. Vetter.* Stipulation and order dismissing action with prejudice, May 7, 1975.

2,884,694, Hannon and De Nucci, DEVICE FOR PRESSING AND MOLDING PLASTIC FOOD PRODUCTS; **3,235,886,** G. A. Scharmer, KITCHEN SINK AND METHOD OF MAKING THE SAME, **filed** Oct. 28, 1975, United States Court of Appeals, Sixth Circuit, Ohio (Cincinnati), Doc. 74-2148, *George Scharmer* v. *Carrollton Manufacturing Company et al.* The judgment of the District Court affirmed, Oct. 28, 1975.

2,919,990, Podlesak, Kraft and Miller, METHOD OF CONTINUOUSLY PRODUCING PACKAGED UNITS, **filed** Jan. 4, 1974, D.C., E.D. Wis. (Milwaukee), Doc. 74-C-4, *Kraftco Corporation* v. *Milwaukee Cheese Co., Sheboyan Sausage Co., and Robert H. Zwicky.* Action dismissed, Aug. 29, 1974.

3,012,303, Whitaker, Whitaker and Whiting, PRODUCTION OF MULTICOLORED PILE FABRIC, **filed** June 5, 1972, D.C., E.D. Tenn. (Chattanooga), Doc. 6525, *Fred Whitaker Company* v. *Colorstrand Corporation.* Case dismissed without prejudice to plaintiff's right to reassert same following a final decision of a companion case now pending in the Fifth Circuit Court of Appeals, Oct. 29, 1975.

3,031,725, R. E. Omholt, FLOORING SYSTEMS, **filed** Sept. 24, 1971, D.C., E.D. Wis. (Milwaukee), Doc. 71-C-486, *Powerlock Systems, Inc.* v. *Duo-Lok, Inc. and Baseman Bros., Inc.* Order dismissing complaint with prejudice, Oct. 30, 1974.

3,073,536, J. N. Quinn, PORTABLE CRUSHING PLANT; **3,409,235,** same, **filed** Nov. 17, 1972, D.C., E.D. Wis. (Milwaukee), Doc. 72-C-634, *John N. Quinn and Johnson Welding and Equipment Co.* v. *Lippmann, Inc. and Edmund Lippmann and Gladys Lippmann, doing business as Gilco Co.* Final judgment filed Jan. 17, 1975.

3,124,385, H. P. Neptune, CABLE LIFT PICK-UP UNIT, **filed** Feb. 5, 1974, D.C., S.D. Calif. (San Diego), Doc. 74-56-S, *Superior Concrete Accessories, Inc.* v. *Herman P. Neptune.* Defendant owner of said patent. Judgment on complaint entered for plaintiff, Oct. 29, 1975.

3,127,293, A. J. Trenteseaux, METHOD OF PRODUCING UNWOVEN CLOTHS AND VELVETS AND APPARATUS USED THEREFOR, **filed** Aug. 28, 1974, D.C., N.D. Ga. (Atlanta), Doc. C74-1723, *Deering Milliken, Inc.* v. *Kemos, Inc.* Consent stipulation of dismissal dismissing action without prejudice pursuant to Rule 41(a)(1)(ii), Oct. 28, 1975.

3,235,886. (See 2,884,694.)

3,343,630, Redman and Werner, FRONT LOADING EXTENSION LADDERS; **3,354,987,** Werner and Kocina, LADDERS; **3,477,120,** Werner and Sulecki, METHOD OF MAKING LADDER JOINT; **3,481,026,** Lindesmith, Sulecki, and Tuck, METHOD OF JOINING A LADDER RUNG TO A SIDE RAIL; **3,528,525,** same, LADDER CONSTRUCTIONS; **D. 214,892,** R. P. Sulecki, LADDER, **filed** Sept. 15, 1971, D.C., N.D. Iowa (Cedar Rapids), Doc. 72-C-509-EC, *R. D. Werner Co., Inc.* v. *Sears, Roebuck & Co. and Chamberlain Mfg. Corp.* By consent of the parties, this cause shall be and is hereby dismissed with prejudice, Nov. 4, 1975.

3,354,987. (See 3,343,630.)

3,409,235. (See 3,073,536.)

3,477,120. (See 3,343,630.)

3,481,026. (See 3,343,630.)

3,499,302, Spain, Oliver, Flora and Powell, CYLINDER LOCK, **filed** Nov. 17, 1975, D.C., W.D. Va. (Roanoke), Doc. 75-0185, *Emhart Corporation* v. *Medeco Security Locks, Incorporated.*

3,528,525. (See 3,343,630.)

3,625,581, P. Frederick, COMPACT OFFICE FILING CABINET, **filed** Nov. 7, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3812, *Supreme Equipment and Systems Corporation* v. *Interstate Industries, Inc.*

3,670,611, D. J. Jarman, SHEAR DISCHARGE CONVEYING SYSTEM, **filed** Aug. 1, 1974, D.C., E.D. Tex. (Sherman), Doc. S-74-59-CA, *Continental M.D.M., Inc.* v. *Hadco, Inc.* Judgment on jury verdict finding that the patent involved herein is valid, but not infringed, entered Nov. 5, 1975.

3,821,463, W. F. Bakker, ELECTROMAGNETIC SHIELDING MATERIAL, **filed** Nov. 14, 1975, D.C.N.J. (Newark), Doc. 75-1953, *Metex Corporation* v. *Radcon Corporation.*

3,831,533, H. F. Kellogg, SHELVING SYSTEM, **filed** Nov. 12, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3859, *Kirsch Company* v. *Newell Companies, Inc.*

3,838,437, H. Hamm, PHOTOGRAPHIC LENS ADAPTER RING FOR INTERCHANGEABLE LENSES, **filed** Oct. 30, 1975, D.C.N.J. (Newark), Doc. 75-1868, *Jerome R. Fund* v. *Rollei of America et al.*

3,861,989, Ashenfarb, Weinblatt, Glowzenski, METHOD OF MAKING MIRRORS HAVING RANDOM REFLECTIVE DECORATION, **filed** Jan. 23, 1975, D.C.N.J. (Newark), Doc. 75-118, *Hoyne Industries Incorporated* v. *New Age Mirror and Tile Industries, Inc.* Stipulation of dismissal of action, Nov. 12, 1975.

3,896,288, M. J. Tulkoff, METHOD OF HEAT-SINK WRAPPING GOODS, **filed** Nov. 14, 1975, D.C. Md. (Baltimore), Doc. H-75-1653, *Black Body Corporation* v. *Shrink-O-Matic, Inc. and Martin J. Tulkoff.*

D. 214,892. (See 3,343,630.)

Second Trial Voluntary Protest Program

A Second Trial Voluntary Protest Program will be conducted during the coming months. It will be increased in scale and somewhat modified in procedure from the first such program. Announcement of and description of the rules for the first program appeared in 923 O.G. 2 on June 4, 1974.

As before, the objective is to gain experience in carrying out such a program and to determine the extent of interest by the public in participating and in supplying pertinent references. To the extent there is participation, the program should be beneficial by bringing new art to the attention of the Office, preventing inadvertent issuance of invalid patents, and increasing confidence in the strength of those patents which survive the protest proceedings.

The first Trial Voluntary Protest Program showed a considerable interest by applicants and the public in taking part in protest proceedings. A summary of the results will be published soon in this Gazette. The second Trial Voluntary Protest Program is designed to gain additional information as to public participation and also to follow more closely the procedures which would be required in a continuing, permanent protest program.

Applications Involved

In the second Trial Voluntary Protest Program, a Request to Participate and Waiver of Confidentiality form (PTOL-224 Temp.) will be sent to each applicant to whom a Notice of Allowance is mailed during a selected three week period, probably in October, 1975. The total number of requests mailed will be about 4,500. Applications for plant patents will be excluded from the program. The reason for this exclusion is the high cost of printing colored drawings and the relatively limited prior art available. No other applications will be excluded from the trial program, regardless of subject matter, type of application or earlier proceedings.

Waiver of Confidentiality

Two copies of the form letter requesting voluntary waiver of confidentiality (form PTOL-224 Temp.) will be mailed

in the same envelope along with the Notice of Allowance. An additional copy of the form letter will be made of record in each application at the time of mailing. The applicant will have three months from the notice of allowance date in which to either (1) elect to participate in the Trial Voluntary Protest Program by filing a signed waiver of confidentiality, or (2) elect not to participate in the program by paying the issue fee. If he does neither, the application will become abandoned, as provided in 37 C.F.R. 1.316. The waiver of confidentiality is a part of form PTOL–224 Temp. This procedure will avoid any increase in pendency time for those applications in which an election is made not to participate in the program. An early filing of a waiver of confidentiality by the applicant will result in early publication of the application.

Publication

If the applicant decides not to participate in the protest program and payment of the issue fee is timely made, the patent will issue routinely without delay.

If the applicant elects to participate in the protest program and a signed waiver of confidentiality is filed in the Office within 3 months of the notice of allowance date, the Notice of Allowance will be vacated. In such a case the issue fee should not be filed, as it will not be accepted and applied if filed with a signed waiver of confidentiality. An additional Notice of Allowance will be issued after the protest proceedings have been completed if only allowable claims remain in the application.

After a signed waiver has been filed, the application will be printed in the form of a patent and be available for sale as in the first Trial Voluntary Protest Program. At least one claim and a drawing figure, if any, will be printed in the OFFICIAL GAZETTE. These published applications will appear in about 6 to 9 issues of the OFFICIAL GAZETTE early in 1976. Advance notice will be given in the OFFICIAL GAZETTE of the dates on which applications will be published under this program.

Inspection of Files

The Patent and Trademark Office files of the published applications will be available for inspection by the public for a period of three months after publication. The application files will be retained in a single location in the Patent Issue Division during the protest period. This single location will be staffed with personnel to process papers directed to these files, supervise inspection of the files by the public, provide copies of file contents when ordered, and perform other related duties. A coin operated copying machine will also be available at this location.

Filing of Protests

Protests relating to the patentability of any published application must be filed in writing in the Patent and Trademark Office no later than three months after publication of the application. No extension of the three month protest period will be granted. Each protest must be filed in duplicate (one copy will be forwarded to the applicant and the other copy will be placed in the application file) and must indicate the grounds for protesting the allowance of any claim contained in the published application. If the protest involves prior art not of record in the application, two copies of the alleged prior art, together with an explanation of the relevance of such prior art to the allowed claims, should be included. The protester may also comment on the prior art record in the application and the manner in which it was applied.

In those applications where prima facie evidence of prior public use or sale the claimed invention is presented in accordance with 37 C.F.R. 1.292, public use proceedings will give the protester an opportunity to present evidence.

Should claims be copied from a published application for interference purposes, the applicant copying claims must also file a notice of such copying in the file of the published application to avoid the possibility of inadvertent issuance of the published application as a patent before conclusion of any interference proceedings.

For easy identification, all protests should be headed, "Protest Under Trial Voluntary Protest Program" and be addressed to:

Commissioner of Patents and Trademarks
Box TVPP
Washington, D.C. 20231

The protester should fully identify himself and include his mailing address so that communications may be addressed to him. In view of administrative problems encountered in the first Trial Voluntary Protest Program in protecting the confidentiality of the identity of protesters, no attempt will be made by the Office to maintain the confidentiality of any protester under the new program.

If no protests are received during the protest period, the application file will be rerouted for the mailing of a new Notice of Allowance. The file will not be returned to the examining group except for consideration of matters which normally require return of an allowed file.

If one or more protests are filed in an application, the application file and the protest(s) will be returned to the examining group for consideration.

Consideration of Protest

The examining group will acknowledge receipt of all protests. The authority for deciding whether or not the evidence submitted constitutes a prima facie showing of unpatentability of any allowed claim will reside with the Group Director. If the Group Director decides that no such showing has been made, the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. Protesters will be notified in such cases that prosecution has not been reopened, and the applicant will be sent a duplicate copy of all protests. The decision of the Group Director will be final and will not be subject to petition by a protester.

If the Group Director decides that the submitted evidence constitutes a prima facie showing of unpatentability of any allowed claim, prosecution of the application will be reopened. The decision to reopen prosecution will be communicated to the applicant by means of an Office action, signed by a primary examiner, rejecting any claim considered unpatentable. The duplicate copy of each protest will be mailed to the applicant with the Office action. Protesters who submitted evidence on which the rejection is based will be identified in the Office action and will also receive copies of this and subsequent Office actions. Other protesters will be notified that prosecution has been reopened, but based on evidence and for reasons other than those submitted by them and that, consequently, no further correspondence will be directed to them. The applicant will normally be given a three month shortened statutory period to respond to the Office action.

Response by the Applicant to Subsequent Office Actions

During this period, the applicant may present amended or new claims which will be subject to further consideration by the primary examiner. In order to allow protesters who submitted evidence on which a rejection in the Office action is based to participate in later prosecution and to comment upon further proceedings, applicant will be required to serve by mail upon each protester identified in the Office action, a copy of any response filed, including any appeal brief. Indication of such service will be a required component of a complete response. Applicant need only reply to the rejections and objections made in the Office action. There need be no specific response to any other points raised by the protesters.

Comment on Applicant's Response by the Protester

Each protester served will be allowed one month, running from the date applicant's response or brief is received in the Patent and Trademark Office, to file comments relating thereto. All communications from protesters must be in writing. Examiner interviews with the protesters will not be permitted. No extensions of the one month period will be granted.

Any appeal by the applicant to the Board of Appeals in a protested application will be made special and will be taken up out of order.

Conclusion of Prosecution

If, after further prosecution, the application is found to be allowable, all protesters still participating at that time will be notified and the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. A decision of the primary examiner to allow an application will not be subject to petition or appeal by any protester.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Sept. 16, 1975.

[938 O.G. 945]

PATENT NOTICES

Certificates of Correction for the Week of Mar. 16, 1976

Re. 28,477	3,887,741	3,911,183	3,923,832
3,545,606	3,887,811	3,911,395	3,924,091
3,619,161	3,887,878	3,911,776	3,924,143
3,628,955	3,889,011	3,912,340	3,924,259
3,674,891	3,890,397	3,912,493	3,924,286
3,705,021	3,891,004	3,912,736	3,924,425
3,713,827	3,891,155	3,912,831	3,924,453
3,716,754	3,891,935	3,913,032	3,924,520
3,728,329	3,892,176	3,913,332	3,925,027
3,728,881	3,893,137	3,913,908	3,925,231
3,736,188	3,893,955	3,914,139	3,925,365
3,747,121	3,894,031	3,914,362	3,925,422
3,753,079	3,894,128	3,914,766	3,925,552
3,755,441	3,894,221	3,915,736	3,925,565
3,785,258	3,895,137	3,916,430	3,925,765
3,804,441	3,896,011	3,917,400	3,925,833
3,807,211	3,896,249	3,917,522	3,925,834
3,809,032	3,897,280	3,917,735	3,926,470
3,809,911	3,897,385	3,917,878	3,926,624
3,812,118	3,897,480	3,917,912	3,926,655
3,818,347	3,897,556	3,918,091	3,926,665
3,822,147	3,898,847	3,918,277	3,926,832
3,829,440	3,899,726	3,918,493	3,926,893
3,831,131	3,899,755	3,918,563	3,927,158
3,833,196	3,899,864	3,918,572	3,927,528
3,834,801	3,899,877	3,918,715	3,927,830
3,839,008	3,900,330	3,918,942	3,927,837
3,839,362	3,900,551	3,918,952	3,927,915
3,849,445	3,901,331	3,918,962	3,928,015
3,855,515	3,902,974	3,919,144	3,928,096
3,856,725	3,903,338	3,919,177	3,928,099
3,859,303	3,903,506	3,919,396	3,928,103
3,859,361	3,904,121	3,919,462	3,928,431
3,861,457	3,904,639	3,919,564	3,928,620
3,862,134	3,904,769	3,919,654	3,928,672
3,864,492	3,904,774	3,919,796	3,928,961
3,865,968	3,905,230	3,919,846	3,929,103
3,867,111	3,905,399	3,919,852	3,929,140
3,869,412	3,905,466	3,919,936	3,929,324
3,872,108	3,906,071	3,919,994	3,929,382
3,872,127	3,906,885	3,920,024	3,929,426
3,876,576	3,907,169	3,920,061	3,929,460
3,877,511	3,907,507	3,920,132	3,929,584
3,878,309	3,907,689	3,920,571	3,929,760
3,879,825	3,908,243	3,921,346	3,929,846
3,884,469	3,909,553	3,921,410	3,930,000
3,884,642	3,909,686	3,921,802	3,930,167
3,884,887	3,910,133	3,922,329	3,930,436
3,886,195	3,910,521	3,922,485	3,931,799
3,886,604	3,910,646	3,922,508	
3,886,979	3,911,119	3,922,604	
3,887,503	3,911,145	3,923,276	

Dedications

3,479,470.—*James H. Ham, Jr.*, Indianapolis, Ind. CODE TRANSMITTER. Patent dated Nov. 18, 1969. Dedication filed Nov. 10, 1975, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,568,157.—*Randall W. Downing*, Wheaton, Ill., *Michael P. Fabisch*, Bronx, N.Y., and *John A. Harr*, Geneva, *John S. Nowak*, Wheaton, *Frank F. Taylor*, West Chicago, and *Werner Ulrich*, Glen Ellyn, Ill. PROGRAM CONTROLLED DATA PROCESSING SYSTEM. Patent dated Mar. 2, 1971. Dedication filed Dec. 10, 1975, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,701,407.—*Constantine W. Kulig*, Windsor, Conn. GLASSWARE TRANSFER MECHANISM. Patent dated Oct. 31, 1972. Dedication filed Jan. 7, 1976, by the assignee, *Emhart Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,712,706.—*Robert Fran Stamm*, Stamford, Conn. RETROREFLECTIVE SURFACE. Patent dated Jan. 23, 1973. Dedication filed Oct. 6, 1975, by the assignee, *Reflexite Corporation.*

Hereby dedicates to the Public the remaining term of said patent.

Disclaimers

3,189,615.—*Hansjorg Heller*, Basel, *Ernst Keller*, Basel-Land, and *Hermann Gysling*, Basel, Switzerland, and *Fritz Mindermann*, Baden, Germany. 2-ARYL-4,5-ARYLO-1,2,3-TRIAZOLE. Patent dated June 15, 1965. Disclaimer filed Dec. 3, 1975, by the assignee, *H. A. Whitten & Co.*

Hereby enters this disclaimer to claims 1 through 8, inclusive, of said patent.

3,672,155.—*John M. Bergey* and *Richard S. Walton*, Lancaster, Pa. SOLID STATE WATCH. Patent dated June 27, 1972. Disclaimer filed Oct. 3, 1975, by the assignee, *Time Computer, Inc.*

Hereby disclaims the entire remaining term of said patent.

3,698,691.—*Thomas W. Brown*, Chattanooga, Tenn. FENCE BARB ARM. Patent dated Oct. 17, 1972. Disclaimer filed Dec. 31, 1975, by the Inventor.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,722,589.—*Arthur W. Smith, Ray A. Plummer* and *Charles Wayne Johnson*, all of Houston, Tex. WELL PRODUCTION TESTING AND FLOW CHARACTERISTIC EVALUATION METHODS USING SMALL DIAMETER TUBING. Patent dated Mar. 27, 1973. Disclaimer filed Jan. 2, 1976, by the assignee, *Big Three Industries, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

3,722,594.—*Arthur W. Smith, Ray A. Plummer* and *Charles Wayne Johnson*, all of Houston, Tex. WELL METHODS USING SMALL DIAMETER TUBING. Patent dated Mar. 27, 1973. Disclaimer filed Jan. 2, 1976, by the assignee, *Big Three Industries, Inc.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,757,959.—*George J. Thompson* and *Vance D. Dutton*, Marion, Ohio. BOOM POINT SHEAVE ASSEMBLY. Patent dated Sept. 11, 1973. Disclaimer filed Dec. 30, 1975, by the assignee, *Marion Power Shovel Company, Inc.*

Hereby enters this disclaimer to claim 2 of said patent.

3,917,495.—*F. Hubbard Horn*, deceased, late of Schenectady, by Helen W. Horn, executrix, Schenectady, N.Y. METHOD OF MAKING IMPROVED PLANAR DEVICES INCLUDING OXIDE-NITRIDE COMPOSITE LAYER. Patent dated Nov. 4, 1975. Disclaimer filed Jan. 12, 1976, by the assignee, *General Electric Company.*

The term of this patent subsequent to Aug. 3, 1988, has been disclaimed.

National Technical Information Service

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DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE INTERIOR
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Washington, D.C. 20240

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Assistant Chief for Patents, Office of Naval Research,
Code 302, Arlington, Va. 22217

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
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Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

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U.S. ENVIRONMENTAL PROTECTION AGENCY

Room W513, 401 M Street SW., Washington, D.C. 20460

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U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Streets NW., Washington, D.C. 20240

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U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research, Code 302, Arlington, Va. 22217

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Patent application 587,445. In-Line Waveguide to Coax Transition. Filed June 16, 1975. PC $3.25/MF $2.25.

Patent application 588,914. PbS-Al Selective Solar Absorber. Filed June 20, 1975. PC $3.25/MF $2.25.

Patent application 589,489. Efficient Dye Laser Materials for the Ultraviolet. Filed June 20, 1975. PC $3.25/MF $2.25.

Patent application 600,255. Optical Measurement of the Difference in Alignment Between Reference Frames. Filed July 30, 1975. PC $3.25/MF $2.25.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 28, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-30-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-3-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-13-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-28-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-16-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	1-2-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	3-17-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-5-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-29-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-5-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	12-12-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	4-1-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	6-3-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-4-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-28-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	8-5-75

Expiration of patents: The patents within the range of numbers indicated below expire during March 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,875,445 to 2,880,418 inclusive
Plant Patents..... Numbers 1,814 to 1,826 inclusive

PATENT APPLICATIONS

PUBLISHED MARCH 16, 1976
UNDER THE SECOND TRIAL VOLUNTARY PROTEST PROGRAM

NOTE- A copy of the notice setting forth the details of the Second Trial Voluntary Protest Program may be found in the Patent and Trademark Notices section of this issue.

Any protests relating to the patentability of these published applications must be filed in writing before June 16, 1976. These applications are available for inspection in the Allowed Files Branch, Crystal Plaza, Room 2-10C28. All correspondence should be addressed to:

Commissioner of Patents and Trademarks
Box TVPP
Washington, D.C. 20231

Printed copies of the published applications may be purchased from the Patent and Trademark Office at 50 cents each.

An "Index of Applicants and Assignees of Published Applications" and a concordance entitled "Classification of Published Patent Applications" are located in the back of this issue.

GENERAL AND MECHANICAL APPLICATIONS

B 279,415
MECHANICAL RETENTION SYSTEM FOR USE WITH CASELESS AMMUNITION

Seymour Levine, Chicago, Ill., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 10, 1972, Ser. No. 279,415
Int. Cl.[2] F42B 5/02
U.S. Cl. 102—38 **3 Claims**

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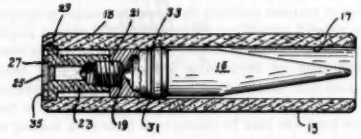

1. A telescoped round of caseless ammunition comprising, a propellant charge of substantially cylindrical configuration and having an axial bore therethrough, said propellant charge having a forward portion and a rearward portion,

a projectile positioned in the forward portion of and completely within the bore of said propellant charge,

a tubular igniter positioned in the rearward portion of said propellant charge immediately aft of said projectile,

means for threadably connecting said tubular igniter to the base of said projectile, and

a primer disposed within the rearwardmost portion of said igniter, said primer being in operative engagement with a shoulder on said igniter to support and effectively prevent forward movement of said primer upon firing pin impact.

B 384,225
ELECTRO-OPTIC CERAMIC MATERIAL

Yoshiro Otomo, Mitaka, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed July 31, 1973, Ser. No. 384,225
Claims priority, application Japan, July 31, 1972, 47-75916
Int. Cl.[2] G02F 1/26
U.S. Cl. 350—150 **30 Claims**

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Thacher, Electrocaloric Effects in Some Ferroelectric and Antiferroelectric Comp., Journal of App. Phys., Vol. 39, No. 4, Mar. 1968, pp. 1996–2002.

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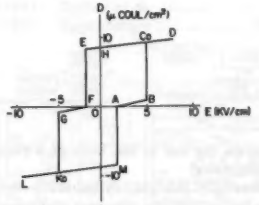

1. A longitudinal electro-optic ceramic material comprising a solid solution in which two phases coexist with one another with a morphotropic phase boundary therebetween, one of said phases being selected from the group consisting of an anti-ferroelectric phase and a para-electric phase, the other of said phases being a ferroelectric phase.

B 397,674
EXTRUDER PLASTICIZING AND MIXING SCREW

Nickolas N. Sokolow, Roscoe, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Sept. 17, 1973, Ser. No. 397,674
Int. Cl.² A21C 1/06; B29B 1/06
U.S. Cl. 259—191 8 Claims

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UNITED STATES PATENTS

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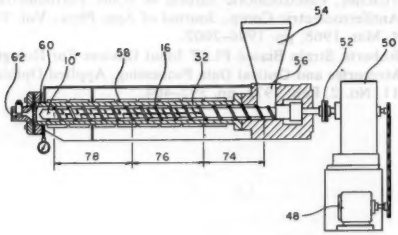

1. A screw for use in the bore of a plastic extruder, said screw comprising:

a substantially straight, cylindrically shaped center shaft member of uniform diameter and cross-section throughout the length thereof having a longitudinal axis of rotation and a peripheral surface;

a raised screw thread superimposed on the shaft member and extending continuously axially therealong;

a plurality of land surface areas on the shaft member surface, non-coincident therewith, along the pitch length of the screw thread for at least a portion of the screw length;

the land surface areas are arranged in a checkerboard pattern in the direction of a path following and adjacent the screw thread along the shaft member surface, wherein some of the land surface areas form the bottoms of pockets recessed in the shaft member surface, and some of the land surface areas form the upper surfaces of lobes extending above the shaft member surface.

B 431,334
ROLL BRIQUETTING PRESS

Peter Mersch; Walter Siepermann, both of Hattingen (Ruhr), and Kurt Zech, Unna, all of Germany, assignors to Koppern & Co. KG., Germany

Filed Jan. 7, 1974, Ser. No. 431,334
Claims priority, application Germany, Jan. 8, 1973, 2300702
Int. Cl.² B29C 3/02, 3/04
U.S. Cl. 425—237 6 Claims

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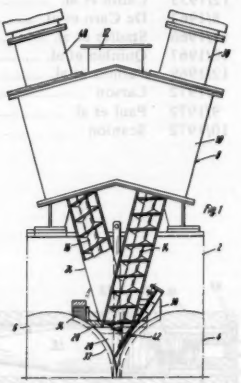

1. A roll briquetting press, comprising a housing, a pair of press rolls mounted in said housing and being rotatable in counter rotation relative to each other, a conveyor assembly mounted on said housing and including a filler vessel located vertically above said press rolls for receiving the material to be briquetted therein, a plurality of screw conveyors communicating with said filler vessel and extending downwardly into close adjacent relation to said press rolls and to each other, a filling well located between said press rolls and beneath said conveyors for receiving the briquetting material therein from said conveyors, a plurality of tongue-shaped plates, one of said plates positioned below each of said screw conveyors and cooperating therewith to effectively feed said briquetting material to said press rolls, each of said plates extending substantially tangential to the circumference of one of said press rolls and being inclined at an angle of less than 45° with respect to the vertical, and means for individually adjusting the position of each of said plates relative to said conveyors for evenly distributing the briquetting material to said press rolls.

B 435,570

SKI BINDING COMPONENT

Erwin Weigl, Brunn am Gebirge, Austria, assignor to Gertsch AG, Zug, Switzerland

Filed Jan. 22, 1974, Ser. No. 435,570
Claims priority, application Austria, Jan. 22, 1973, 517/73
Int. Cl.[2] A63C 9/08
U.S. Cl. 280—11.35 R 8 Claims

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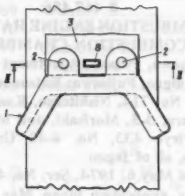

1. A ski binding device for holding at least one of the toe and heel of a ski boot into engagement with an upper surface of a ski, comprising:

base means mounted on said ski and having at least vertical guide means thereon;

vertically movable ski boot engaging means vertically movably mounted on said vertical guide means, at least one of said base means and said ski boot engaging means having horizontal guide means thereon intersecting said vertical guide means;

movable first lock means movably mounted on said horizontal guide means, said ski boot engaging means having second lock means cooperable with said first lock means to effect securement of said vertically movable ski boot engaging means in a selected position relative to said ski;

resilient means for continuously resiliently biasing said ski boot engaging means in a vertically upward direction; and

release means operatively connected to said first lock means for effecting a movement of said first lock means out of cooperating relation with said second lock means to permit a vertical movement of said ski boot engaging means relative to said ski and said ski boot due to the urging of said resilient means.

B 461,250

HANDLE PACKAGE

Karl-Heinz Siegel, 8500 Nurnberg, Germany

Filed Apr. 16, 1974, Ser. No. 461,250
Int. Cl.[2] A45C 13/26; B65D 33/06, 33/24
U.S. Cl. 150—3 4 Claims

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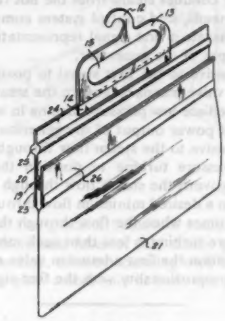
1. A closeable hand-up container including a separable extruded two strip fastener secured to thermoplastic film bag sidewall panels, each fastener strip having separable fastener means to engage closingly with the other, one of the fastener strips including an attachment web secured to one of the bag wall panels and having a carrying web area extending in the opposite direction from juncture of the attachment web and fastener strip, with a one piece handle part welded onto the carrying web area:

said handle part having a horizontally elongated handhole with an overlying hand grip portion provided with a central hanger-bar-receiving hook notch opening downwardly into the handhole;



an entry slot extending from the top of said grip portion to the bottom of said grip portion and generally aligned with the notch opening;

said hand grip portion having grip sections thereof at each side of said notch and said carrying web area having a extruded reinforcement bead rib integral therewith and extending therealong throughout its width adjacently above said juncture and below said handle part.

B 464,027

HTGR POWER PLANT TURBINE-GENERATOR LOAD CONTROL SYSTEM

Andrew S. Braytenbah, Pennsauken, N.J., and Karl O. Jaegines, Chester, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 25, 1974, Ser. No. 464,027
Int. Cl. F01k 13/02
U.S. Cl. 60—667 40 Claims

References Cited
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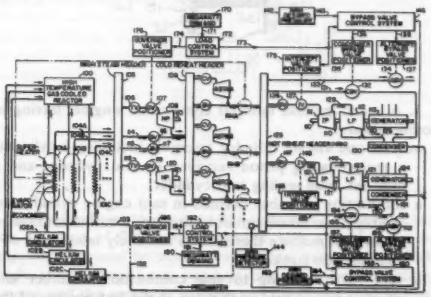

1. A system for controlling the power output of a steam turbine-generator in a power plant wherein a steam source that is adapted to derive heat from a reactor coolant gas generates superheated and reheated steam in respective superheater and reheater sections, said reheater section being connected to furnish reheated steam to a hot reheat header, said coolant gas being circulated through the steam source

and a high temperature nuclear reactor by a gas circulating means, driven by an auxiliary steam turbine means connected to pass at least a portion of the steam flow to the inlet of the reheater section, and said turbine including at least a high pressure turbine connected to pass superheated steam at a rate controlled by a first admission valve means and intermediate-low pressure turbine connected to pass reheated steam at a rate controlled by a second admission valve means, and wherein a bypass line and bypass valve means therein connected may conduct steam from the hot reheat header to a condensing means, said control system comprising,

means to generate a first signal representative of a desired power output of the generator,

means responsive to the first signal to position the second admission valve means to govern the steam flow through the intermediate-low pressure turbine in accordance with the desired power output of the generator,

means responsive to the steam flow through the intermediate-low pressure turbine to position the bypass valve means to govern the steam flow through the bypass line to maintain a desired minimum flow through the reheater section at times when the flow through the intermediate-low pressure turbine is less than such minimum, and

means to position the first admission valve means in predetermined proportionality with the first signal.

B 466,906

SPARK IGNITION ENGINE HAVING COMBUSTION CHAMBER PROVIDED WITH VENT VALVE

Kosaburo Mukai, 2-2-20, Hatanodai, Shinagawa, Tokyo; Motohiro Shinzawa, 3-68, Oppama-Higashicho, and Seishi Yasuhara, Nissan-shataku 6-20, No. 2-13 Tsurugaoka, both of Yokosuka, all of Japan

Filed May 3, 1974, Ser. No. 466,906

Claims priority, application Japan, May 4, 1973, 48-50059

Int. Cl.[2] F02B *23/08*

U.S. Cl. 123—191 S **6 Claims**

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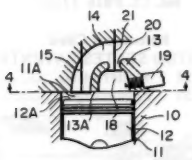

1. A spark ignition internal combustion engine, having in combination:

at least one engine cylinder assembly including a cylinder, a reciprocating piston received in said cylinder and a cylinder head sealing said cylinder;

a combustion chamber defined in said engine cylinder assembly in an arrangement to produce a turburent flow of an air-fuel mixture therein at a relatively later stage of a compression stroke;

a vent valve opening to said combustion chamber and means opening said vent valve at the last portion of the compression stroke and closing said vent valve before ignition, whereby a fractional amount of the air-fuel mixture is discharged from said combustion chamber to weaken the turburent flow; said combustion chamber being formed of a cylindrical chamber defined in said cylinder between a top surface of said piston and a base surface of said cylinder head, and a dome-shaped recess formed in said cylinder head, the bottom thereof being opened and conjoined with said cylindrical chamber, a major portion of said combustion chamber being defined by said dome-shaped recess; a spark plug being arranged to expose a spark gap thereof to said dome-shaped recess, and said vent valve is opening to said dome-shaped recess; said dome-shaped recess being formed in said cylinder head off center from a longitudinal center line of said cylinder, the open end of said dome-shaped recess having an opening area smaller than 50% of the cross-sectional area of the cylinder to which the opening is conjoined; and said vent valve is located at a curved end region of said dome-shaped recess which is opposite the open end thereof.

B 467,486

INTERNAL COMBUSTION ENGINE HAVING AUXILIARY COMBUSTION CHAMBERS

Yasuhiko Nakagawa, Nissan Apartment 12-302, No. 3-1, Tsujido-nishikaigan, Fujisawa; Katsunori Terasaka, Nissan-nishiteraoryo, No. 714, Nishiterao, Kanagawa, Yokohama; Susumu Kimura, 3-5, Morisaki, and Masanobu Yoshioka, Nissan-natagiriryo 433, No. 4-42 Uragoh-cho, both of Yososuka City, all of Japan

Filed May 6, 1974, Ser. No. 467,486

Claims priority, application Japan, May 8, 1973, 48-50942; May 8, 1973, 48-50943; May 8, 1973, 48-50944

Int. Cl.[2] F01L *1/34*

U.S. Cl. 123—32 SP **12 Claims**

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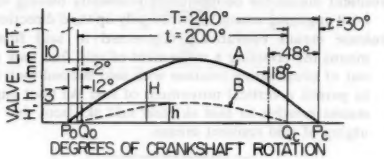

1. A reciprocating-piston, four-stroke spark-ignition internal combustion engine having main and auxiliary combustion chamber comprising main and auxiliary intake valves respectively associated with said main and auxiliary combustion chambers in each of engine cylinders, the auxiliary intake valve having a valve lift smaller than a valve lift of the main intake valve, the auxiliary intake valve being operated to open for a duration shorter than a duration of opening of the main intake valve, the auxiliay intake valve being operated to start to open after the main intake valve has been opened, and to fully close simultaneously as or before the main intake valve is fully closed and to fully close at a timing later than the bottom dead center of the engine on the compression stroke.

B 468,330
ABLATIVE SURFACE INSULATOR
Joseph W. Chambers, Woodland Hills, Calif., and Lester E. McTaggart, Jackson, Tenn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed May 9, 1974, Ser. No. 468,330
Int. Cl.² B32B 1/00
U.S. Cl. 428—175 **4 Claims**

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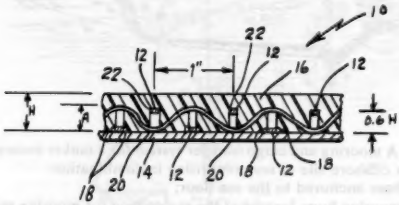
3,352,739	11/1967	Blue	161/89
3,449,157	6/1969	Wandel	161/137
3,530,033	9/1970	Hildebrandt	161/144
3,565,734	2/1971	Shanok et al.	161/213
3,655,502	4/1972	Yoshihawa	161/148
3,679,537	7/1972	Huer et al.	161/89



1. An ablative surface insulation for withstanding extreme temperature comprising a plurality of interwoven strips of metal capable of withstanding temperatures in excess of 700°F fixedly secured to a base material which is incapable of withstanding said extreme temperature, said strips being formed in a convoluted design producing a diagonal matrix having nodes and peaks, said nodes of said strips in one direction matching said peaks in another direction, a silicone elastomeric insulating material molded to and encompassing said plurality of strips and said convoluted strips having a pitch of approximately 1 inch and having an amplitude equal to approximately 0.6 the height of said insulating material.

B 469,036
SCANNING DEVICE
Denis Manktelow Neale, and Michael Gordon Throssell, both of Ilford, England, assignors to Ilford Limited, England
Filed May 10, 1974, Ser. No. 469,036
Int. Cl.² G02B 27/17
U.S. Cl. 350—7 **17 Claims**

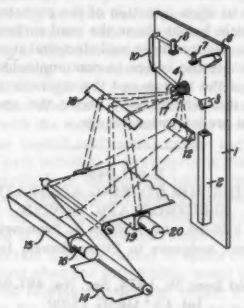
References Cited
UNITED STATES PATENTS

3,206,606	9/1965	Burgo et al.	356/200
3,485,546	12/1969	Roth	178/7.6
3,556,664	1/1971	Blaisdell et al.	356/200
3,573,849	4/1971	Herriot et al.	350/7
3,574,469	4/1971	Emerson	356/200
3,646,568	2/1972	Woywood	350/7
3,693,021	9/1972	Lake, Jr. et al.	356/200

1. A method of scanning surface areas, said method comprising:

providing two substantially parallel beams of radiant energy of different cross-sectional area;

directing said two beams to strike individually a like number of different faces of a rotating mirror polygon, thereby deflecting the reflected paths of said beams through angles equal to twice the angular subtense of each polygon face at the polygon center; and

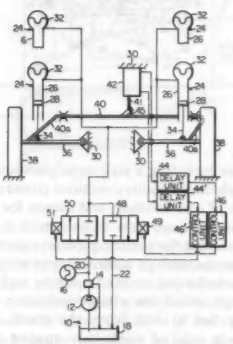


directing said two parallel beams of radiant energy after reflection from said faces of said mirror polygon onto at least one surface, thereby scanning with both said beams at least one path across said at least one surface.

B 471,706
VEHICLE HYDROPNEUMATIC SUSPENSION SYSTEM WITH VEHICLE BODY HEIGHT CONTROL MEANS
Mituo Hiruma, 2-693, Hanakoganei, Kodaira, Tokyo, Japan
Filed May 20, 1974, Ser. No. 471,706
Claims priority, application Japan, May 21, 1973, 48-55521
Int. Cl.² B60G 11/28
U.S. Cl. 280—124 F **9 Claims**

References Cited
UNITED STATES PATENTS

3,704,895	12/1972	Remaud	280/124 F
3,729,211	4/1973	Engfer	280/124 F
3,820,818	6/1974	Kress	267/64
3,831,969	8/1974	Lindblom	280/6 H



1. In a fluid operated suspension system of a vehicle including a source of fluid under pressure with a fluid reservoir, adjustors disposed between vehicle wheel axles and a vehicle body, valves operative to communicate the adjustors with the source and the reservoir to raise and lower the vehicle body respectively relative to a road surface and a stabilizer bar connected to at least two of the adjustors, the improvement comprising:

sensing means disposed between the vehicle body and the stabilizer bar to sense an angular orientation of the stabilizer bar relative to a longitudinal axis of the vehicle body and operative to produce an electrical signal when said

angular orientation is outside a predetermined range indicating that a vehicle height above the road surface is outside a predetermined range, said sensing means being adjustable to allow selection of the predetermined range of the vehicle height above the road surface; and

control means responsive to said electrical signal and operative to actuate the valves to communicate the adjustors with one of the source and the reservoir to restore the height of the vehicle body above the road surface to within said predetermined range.

B 481,048

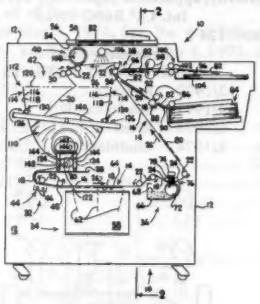
PHOTOCONDUCTOR STORING APPARATUS FOR AN ELECTROSTATIC COPIER

John A. Toto, Milford, and William E. Pennings, S. Norwalk, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed June 20, 1974, Ser. No. 481,048
Int. Cl.² G03G *15/00*
U.S. Cl. 355—16 **8 Claims**

References Cited
UNITED STATES PATENTS

2,865,639	12/1958	Gillesse et al.	270/61 F X
3,123,269	3/1964	Morley et al.	226/118
3,311,279	3/1967	Yeiser	226/118
3,464,610	9/1969	Koning	226/118 X
3,724,838	4/1973	Orlovsky	270/61 F X
3,756,488	9/1973	Van Megan et al.	226/119
3,836,138	9/1974	Klepper	270/61 F X



1. In a copier including a strip-type photoconductor having a plurality of photoconductive sections connected in series for folding on top of one another, and means for serially feeding the photoconductive sections to and from a storage station, apparatus for storing the photoconductive sections in a zig-zag folded stack at the storage station comprising:

a. a receptacle having an inlet opening and an outlet opening through which the photoconductive sections are respectively fed to and from the stack, said receptacle including a pair of oppositely spaced walls extending relatively convergently towards one another for guiding the folds of the respective photoconductive sections progressively closer to the outlet opening than the mid-portions thereof in transit through the receptacle;

b. a pair of tamping means respectively movably engaging opposite receptacle walls and cooperating therewith for guiding photoconductive sections toward the outlet opening; and

c. means for moving the respective tamping means out of step with one another toward and away from the stack including means for resiliently interconnecting the respective tamping means to the moving means so as to maintain each of the tamping means in movable engagement with the receptacle wall associated therewith when the tamping means are moved toward and away from the stack.

B 484,769

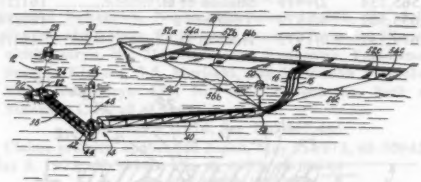
ARTICULATED LOADING ARM WITH END HOSES FOR SINGLE POINT MOORING

John F. Flory, 4 Tower Lane, Morris Township, N.J. 07960

Filed July 1, 1974, Ser. No. 484,769
Int. Cl.² B63B *21/00*
U.S. Cl. 114—230 **11 Claims**

References Cited
UNITED STATES PATENTS

3,455,270	7/1969	Mascenik et al.	114/230
3,472,293	10/1969	Bily	114/230 X
3,572,408	3/1971	Hnot	114/230
3,606,397	9/1971	Flory	285/185
3,840,927	10/1974	Reid	9/8 P



1. A mooring and cargo transfer system for a tanker moored at an offshore site at sea comprising in combination:

a base anchored to the sea floor;

a mooring buoy located at the sea surface for mooring said tanker at said offshore site;

anchor leg means connecting said mooring buoy to said mooring base, including first cargo transfer swivel means operably connected for cargo transfer with underwater cargo piping;

underwater articulated loading arm means extending between said first cargo transfer swivel means and said tanker moored to said mooring buoy, said articulated loading arm means comprising an inboard arm constructed and arranged for cargo transfer therethrough and in cargo transfer relationship with said first cargo transfer swivel means and mounted at a first end for rotational movement in vertical and horizontal directions with respect to said mooring base and extending outwardly from said first cargo transfer swivel means an outboard arm constructed and arranged for cargo transfer therethrough and for movement in horizontal and vertical directions relative to said inboard arm, and intermediate joint means including second cargo transfer swivel means connecting the other end of said inboard arm and a first end of said outboard arm in cargo transfer relationship;

an intermediate joint support buoy located at the sea surface and connected to said intermediate joint means for supporting said joint means above said sea floor;

end support buoy means located at the sea surface and connected to the free end of said outboard arm for supporting said free end above the sea floor;

at least one flexible hose connected at and free end of said outboard arm for transferring cargo from said outboard arm to said moored tanker; and

restraint means connected between said articulated loading arm means and said tanker for positioning said free end of said outboard arm adjacent a predetermined location on said tanker, to facilitate cargo transfer between said underwater piping and said tanker through said first cargo transfer swivel, said inboard arm, said second cargo transfer swivel means, said outboard arm and said flexible hose.

B 488,756

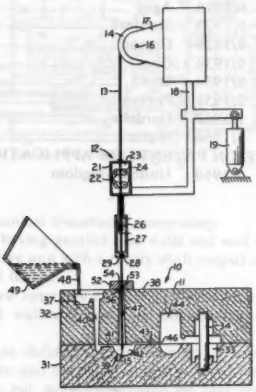
METHOD AND APPARATUS FOR INTRODUCING ADDITIVES INTO A CASTING MOLD

John R. Nieman, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed July 15, 1974, Ser. No. 488,756
Int. Cl.² B22D 27/20
U.S. Cl. 164—57 7 Claims

References Cited
UNITED STATES PATENTS

1,596,888	8/1926	Pacz	164/56 X
2,854,716	10/1958	Funk et al.	164/57
2,882,571	4/1959	Easton	164/56
3,746,078	7/1973	Moore et al.	164/55 X
3,766,961	10/1973	Bunting et al.	164/57 UX
3,851,700	12/1974	McAfee et al.	164/57



1. A method of introducing additives into a casting mold having a casting cavity therein, including the steps of:

forming the casting mold with a down sprue, a mixing chamber, a runner connecting the down sprue with the mixing chamber, a choke at a level above the runner and of smaller cross section than the runner, a riser connected between the choke and the casting cavity, and an ingate disposed between the choke and the riser;

flowing molten metal into a pouring basin formed in the casting mold and connected to the down sprue;

directing the flow of molten metal from the pouring basin through the mixing chamber to the casting cavity;

positioning a wire feeder above the casting mold and in line with an open passage formed in the mold extending upwardly from the mixing chamber;

continuously feeding a substantially endless wire of additive material downwardly through the open passage and into the mixing chamber;

erodibly substantially completely mixing the wire of additive material into the molten metal flowing through the mixing chamber prior to its entry into the casting cavity; and

segregating impurities from the molten metal and collecting such impurities in the riser.

4. An apparatus for introducing additives into a casting mold, comprising;

a casting mold having an internal casting cavity and a flow path within the mold for directing molten metal into said casting cavity;

means forming a pouring basin in the mold for receiving and introducing a flow of molten metal into said flow path;

means forming a mixing chamber in said flow path of said casting mold intermediate the pouring basin and said casting cavity;

means forming an open ended passage in said casting mold in communication with said mixing chamber;

a wire feeder disposed externally of the mold for continuously feeding a substantially endless wire of additive material through said passage and into said mixing chamber so that said wire is erodibly substantially completely mixed with the molten metal flowing through said mixing chamber toward said casting cavity; and

said flow path including a down sprue in the mold extending downwardly from the pouring basin, a runner connecting the down sprue with the mixing chamber, a choke connecting the mixing chamber with said casting cavity and disposed at a level above the runner and having a smaller cross section than the runner to assure complete filling of the mixing chamber with molten metal prior to the molten metal flowing through the choke, a riser connected between the choke and the casting cavity, and an ingate disposed between the choke and riser with the ingate and riser promoting the segregation of impurities from the molten metal with such impurities being collected in the riser.

B 489,550

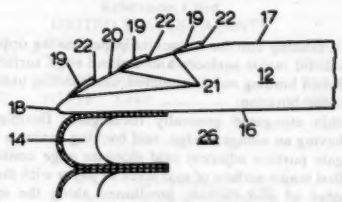
AIR CUSHION VEHICLES

William Arthur Crago, Cowes, England, assignor to British Hovercraft Corporation Limited, Yeovil, England

Filed July 18, 1974, Ser. No. 489,550
Int. Cl.² B60V 1/04
U.S. Cl. 114—67 A 5 Claims

References Cited
UNITED STATES PATENTS

2,322,790	6/1943	Cristadoro	114/67 R
3,410,241	11/1968	Hardy et al.	114/67 A
3,621,932	11/1971	Tattersal et al.	114/67 A
3,650,235	3/1972	Swanson	114/67 A



1. An air cushion vehicle for travelling over water and which, in operation, is supported above the water, at least in part, by a cushion of pressurised air formed beneath the vehicle body, the sides of the cushion being contained by a pair of rigid sidewall structures rigid with the vehicle body and extending longitudinally along the sides of the vehicle body and depending downwardly therefrom so as to dip into the water to a depth such that under normal operation they are always immersed in the water and provide a cushion seal along the sides of the vehicle, each sidewall having inner and outer surfaces with respect to the cushion, the outer surface inclining inwardly when viewed in plan to meet with the inner surface thereof at the forward end of each sidewall, said inner surface at the forward end, when viewed in plan, being substantially straight and substantially parallel to the center line of the vehicle body, a flexible cushion seal extending across the front of the vehicle and of a height which permits water to flow thereunder such that under normal operation water flows along both the inner and outer surfaces of each sidewall, and a cushion seal extending across the rear of the vehicle between said rigid sidewalls, wherein wedge shaped members are pro-

vided on the inclined parts of the outer surfaces at the forward end of the sidewalls, the wedge shaped members being arranged on those portions of the inclined outer surfaces which dip into the water and constituting means for reducing the net differential force exerted on the front ends of each sidewall in a direction normal to the direction of motion of the vehicle by breaking up the flow of water over said inclined parts of the outer surfaces as the vehicle travels over the water.

B 491,618

BINDER UNIT FOR STAPLED BOOKLETS

Joe D. Giulie, Palo Alto, Calif., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

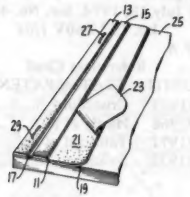
Filed July 24, 1974, Ser. No. 491,618
Int. Cl.² B42D 1/00
U.S. Cl. 281—25 R 1 Claim

References Cited
UNITED STATES PATENTS

1,371,739	3/1921	Dawson	281/36
1,410,000	3/1922	Dawson	281/25 R
2,000,357	5/1935	Smith	281/25 R
3,188,114	6/1965	O'Brien et al.	281/21 R
3,347,565	10/1967	Konkel	281/29 X
3,631,297	12/1971	Conner	206/523 X

FOREIGN PATENTS OR APPLICATIONS

2,645	7/1926	Australia	281/25 R



1. A binding unit for a stack of paper having opposite first and second major surfaces and a spine edge surface around which said binding unit is attached, said binding unit comprising in combination:

a thin elongated generally rectangular flexible backing having an elongate edge, said backing having a first elongate portion adjacent said elongate edge contacting the first major surface of said stack of paper with the elongate edge of said backing positioned along the spine edge surface of the stack of paper;

a plurality of U-shaped staples through the stack of paper and the first portion of said backing, said staple having a central portion along the second major surface of the stack of paper and having terminal ends clinched over the first portion of said backing;

an elongate strip of foam plastic corresponding in shape with the first portion of said backing and being adhered to the first portion of said backing on its surface opposite the stack of paper, said staples extending through said strip of foam plastic and said clinched over ends being embedded in said foam plastic, said strip of foam plastic having a thickness adapted to totally receive the clinched ends of the staples so that said ends do not extend above the foam plastic;

a second strip congruent to said first strip and lying over said strip of foam plastic and over the terminal ends of said staples on the side of said strip of foam plastic opposite said stack of paper;

said backing member extending from said strip of foam plastic around said second strip and being adhered to the surface of the second strip opposite said strip of foam plastic, and extending from said second strip around the spine edge surface of said stack of paper and over at least a portion of the second major surface of said stack of paper and being adhered thereto to cover the central portion of said staples.

B 491,776

SPRAY DEVICE

David Alan Ablett, Midhurst, and Robin Gordon White, Haslemere, both of England, assignors to Imperial Chemical Industries Limited, London, England

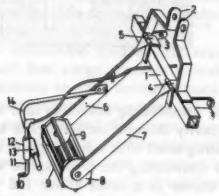
Filed July 25, 1974, Ser. No. 491,776
Int. Cl.² A01M 21/00
U.S. Cl. 47—1.7 10 Claims

References Cited
UNITED STATES PATENTS

809,046	1/1906	Collins	47/1.7
899,404	9/1908	Iten	47/1.44 X
1,188,131	6/1916	Agee	239/150
1,454,824	5/1923	Stubfors	47/1.7
1,509,340	9/1924	Corson	47/1.44 X
1,961,877	6/1934	Gars	47/1.44 X
1,970,984	8/1934	Smith	47/1.7
2,542,498	2/1951	Forbes	47/1.44 X
3,016,653	1/1962	Gardner	47/1.7
3,237,346	3/1966	Watts	47/1.7

FOREIGN PATENTS OR APPLICATIONS

1,152,847	5/1969	United Kingdom



5. A spray device adapted to be moved over the ground in a forward direction for applying a herbicidal spray to an area of unwanted vegetation comprising: a main support; a pair of horizontally spaced apart parallel arms extending downwardly and rearwardly from said support; hinge means connecting the upper end of each arm to said support for swinging movement in a vertical plane, said hinge-means being adjustable toward and away from each other whereby the spacing between the arms can be adjusted; a roller-shaped vegetation presser element having longitudinally extending external ribs, said element being disposed between the lower ends of said arms and being constructed in at least two sections which are movable relative to each other along the axis of said element; means connecting each section to one of said arms for rotation about the axis of said element; and at least one spray nozzle arranged by means of support means in a position rearwardly of said roller-shaped presser element for spraying vegetation which has been pressed down by said presser element as said device is moved forwardly.

B 499,786

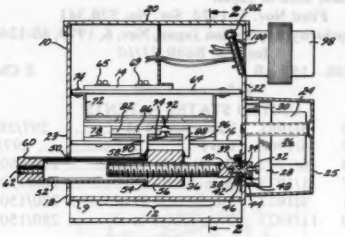
DAMPER ACTUATOR

Hugh J. Tyler, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 22, 1974, Ser. No. 499,786
Int. Cl.² F16K 31/04
U.S. Cl. 74—424.8 VA 10 Claims

References Cited
UNITED STATES PATENTS

2,422,495	6/1947	Morrow	74/424.8 R
2,938,402	5/1960	Willmore	74/424.8 R
3,258,985	7/1966	Jordan	74/424.8 R
3,640,140	2/1972	Gulick et al.	74/424.8 VA
3,720,295	3/1973	Balz	251/134 X



1. A mechanical transducer comprising:
a housing having parallel side walls and end walls;
a motor drive unit with a rotary shaft output carried on one end wall thereof;
a lead screw rotatably carried by thrust bearing means on said end wall and in driven connection to said rotary shaft;
track means defined by channels on opposite side walls parallel to and coextensive with said lead screw;
a traveling nut member engaged on said lead screw and bearing opposite, radially extending side flanges with outboard bulbous edges engaged in said channels;
a tubular member carried by said traveling nut member generally coaxially with said lead screw and extending through the opposite end wall of said housing; and
said tubular member having a closed outboard end bearing work receiving means.

B 503,521

CYLINDRICAL BELT CONVEYOR SYSTEM

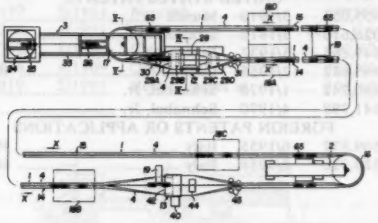
Yoshimasa Yoshida, Tokyo, Japan, assignor to Yoshimasa Yoshida and Marubeni Corporation, both of Tokyo, Japan

Filed Sept. 5, 1974, Ser. No. 503,521
Claims priority, application Japan, Sept. 27, 1973, 48-107933
Int. Cl.² B65G 15/00
U.S. Cl. 198—129 4 Claims

References Cited
UNITED STATES PATENTS

2,886,167	5/1959	Lanier	198/191
2,925,903	2/1960	Robbins	198/191
2,955,699	10/1960	Lanier, Jr.	198/191

1. A suspension type cylindrical belt conveyor system comprising:
a rope tensionally passed in endless fashion between a driving pulley and a tension pulley;
a cylindrical conveyor belt passed in endless fashion between a driving wheel and a tension wheel and being disengageably suspended from said rope through a plurality of hangers so as to be released therefrom at least in a supply station and a discharge station of materials to be transported;
driving means adapted to drive said driving pulley and said driving wheel in interlocking relation so as to drive said rope and said conveyor belt in a synchronously circulating fashion; and
belt disengageable means disposed along the path of travel of said conveyor belt directly behind said material supply station, directly before said material discharge station,



directly behind said driving wheel and dirctly before said tension wheel for operating said hangers to grip and support said conveyor belt in a cylindrical posture directly behind said material supply station and directly behind said driving wheel while disengaging said hangers from said conveyor belt directly before said material discharge station and directly before said tension wheel.

B 504,061

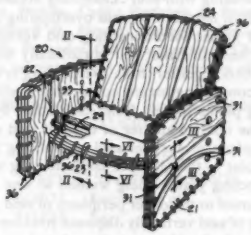
METHOD FOR MAKING A FURNITURE CONSTRUCTION

Donald B. Gold, 260 Canal St., San Rafael, Calif. 94901

Filed Sept. 9, 1974, Ser. No. 504,061
Int. Cl.² B23P 17/00
U.S. Cl. 29—415 18 Claims

References Cited
UNITED STATES PATENTS

609,592	8/1898	Shultz	108/157 X
2,235,290	3/1941	Exline et al.	29/416 UX
2,628,668	2/1953	Basile	297/443 X
3,758,152	9/1973	Lake	108/153 X



1. A method for making a furniture construction comprising the steps of
forming a flat, circular member,
cutting said member into a plurality of panels along chordal lines thereof to define at least one arcuate edge on each of said panels, and
positioning at least some of said panels closely adjacent to each other and releasably attaching said panels one to another to expose at least some of said arcuate edges externally on said furniture construction.

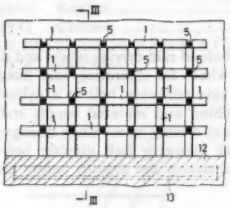
B 504,439
RETAINING WALLS
Masayuki Kurose, Nagasaki, Japan, assignor to Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sept. 9, 1974, Ser. No. 504,439
Claims priority, application Japan, Sept. 12, 1973, 48-102919
Int. Cl.² E02B *3/04*; E04C *1/10*
U.S. Cl. 61—49 **9 Claims**

References Cited
UNITED STATES PATENTS

953,051	3/1910	Muralt	61/37
1,026,616	5/1912	Stratton	61/37
1,847,868	3/1932	Everham	61/37
2,863,682	12/1958	Canepa	403/175
3,490,242	1/1970	Schnabel, Jr.	61/39
3,541,798	4/1970	Schnabel, Jr.	61/39

FOREIGN PATENTS OR APPLICATIONS

509,877	6/1955	Italy	403/218
580,926	8/1958	Italy	403/175



1. A retaining wall having a grid-shaped structure comprising:

a plurality of elongated structural members, some of which are vertically disposed in a mutually aligned relationship, while the other members are horizontally disposed in a mutually aligned relationship and at right angles to said vertically disposed members, each of said structural members comprising an elongate core and an elongate solid body made of concrete molded around said core and having a rectangular transverse section, said body being smaller in length than said core to allow said core to project from opposite ends of said body, said core projections cooperating with said connecting means to connect said structural members in said overlapping cruciform;

a plurality of means for connecting said vertically aligned structural members and said horizontally aligned structural members together in an overlapping cruciform pattern, said connecting means comprising a pair of parallel connecting plates spaced from each other by a distance equal to the outer diameter of each of said core projections, the plane of each of said connecting plates being perpendicular to the plane of said retaining wall, each of said connecting plates being welded at one end on one surface thereof to the outer periphery of said core projection of one of said vertically disposed structural members, the other end of said connecting plate being welded on said one surface to the outer periphery of said core projection of another vertically disposed structural member, said core projection of one of said horizontally disposed structural members being welded to the outer surface of one of said connecting plates and said core projection of another horizontally disposed structural member being welded to the other surface of the other connecting plate;

a square plate having a side length equal to said outer diameter of said core projections and welded to said one surface of said connecting plates along a pair of opposite side edges, a circular hole being provided in the center of said square plate to define said hole means and centered on an intersection of axes of said vertically and horizontally disposed structural members;

a plurality of elongate anchor means each extending through said hole of one of at least some of said connecting means to hold said retaining wall fast to the ground at the site to be protected; and

means for adjustably holding each of said anchor means to one of said connecting means.

B 520,341
CHILD RESTRAINING SEAT
Fumiyuki Abe, No. 885-28, Ichinosawa-cho, Asahi, Yokohama, and Shigeo Fukuda, No. 1140-64, Kamigoh-cho, Totsuka, Yokohama, both of Japan
Filed Nov. 1, 1974, Ser. No. 520,341
Claims priority, application Japan, Nov. 6, 1973, 48-124024
Int. Cl.² B60R *21/10*
U.S. Cl. 280—150 AB **5 Claims**

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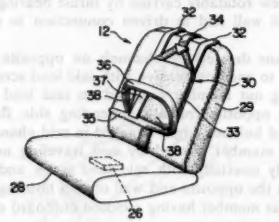
UNITED STATES PATENTS

2,974,718	3/1961	Lawrence et al.	297/385 X
3,245,717	4/1966	Levy	297/254
3,672,699	6/1972	De Windt	280/150 AB
3,713,667	1/1973	Blanchard	280/150 AB
3,758,131	9/1973	Stephenson et al.	280/150 AB
3,773,353	11/1973	Trowbridge et al.	280/150 AB



1. In a motor vehicle having an occupant seat and a trigger circuit of an air bag that corresponds to said occupant seat, said trigger circuit including a seating sensor which is energized when an occupant sits on a seat portion of said occupant seat, to shift said trigger circuit into a condition wherein said trigger circuit will inflate said air bag in collision of the motor vehicle, the improvement comprising a child restraining seat provided with means whereby said child restraining seat is detachably hung securely on a back portion of said occupant seat such that said seating sensor is kept deenergized by seating of a child on said child restraining seat, a first gas producer circuited in said trigger circuit in series with said seating sensor and second gas producer circuited in said trigger circuit such that said second gas producer will be actuated in the collision of said seating sensor, said first and second gas producers being constructed and arranged with respect to said air bag such that said air bag will be inflated to its active position when both of said first and second gas producers are actuated, but said air bag will be inflated to such an inflating position to prevent the child seating on said child restraining seat from being injured upon the inflation of said air bag by the second gas producer and from hitting on an inner structure of the motor vehicle.

B 520,952
ONE-WAY SUPPORT FOR STEERING COLUMN

Hideyuki Usui, and Toshimitsu Kimura, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Nov. 4, 1974, Ser. No. 520,952
Claims priority, application Japan, Nov. 7, 1973, 48-128084
Int. Cl.² F16M 13/02; B60R 21/02
U.S. Cl. 248—205 R 1 Claim

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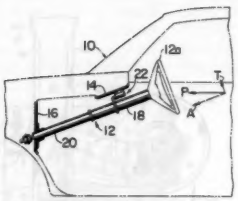
UNITED STATES PATENTS

3,135,224	6/1964	McLean	248/9 X
3,415,140	12/1968	Bien et al.	248/221 X
3,476,345	11/1969	Ristau	248/205 R X
3,621,732	11/1971	Kaniut	248/221 X
3,707,096	12/1972	Bennett	74/492
3,785,671	1/1974	Saleinsky	74/492 X



1. A "one-way" support for a steering column comprising:

a mount bracket having fixed thereon two elongated tubular collars spaced and extending in parallel with each other;

a support member in the form of a rod, said rod having a generally V-shaped intermediate portion and two end portions extending in the same direction from said V-shaped intermediate portion into said collars and in parallel with each other;

said two tubular collars surrounding circumferentially said two end portions, respectively, and spaced therefrom defining therewith annular interspaces, respectively; and two prestressed elastomeric sleeves positioned between said tubular collars and said end portions in said annular interspaces, respectively; said mount bracket being supported in use on an instrumental panel of a vehicle in which a steering column assembly is installed and said V-shaped intermediate portion carrying securely thereon an upper tube portion of the steering column assembly, such that the steering column assembly thereby provides an arrangement whereby application of an axial force to the assembly in a sense tending to cause forward displacement of the upper tube portion urges said V-shaped intermediate portion forwardly and causes said end portions to slip forwardly out of said collars, and upon the application of a lateral force with respect to said axial force, said end portions compress said elastomeric sleeves radially with consequent absorption of said lateral force;

said support member having flanges on said end portions, respectively, engaging forward ends of said tubular collars; and said rod being deformable that upon the application of said lateral force, the upper tube portion of said steering column assembly deforms said V-shaped intermediate portion with efficient absorption of said lateral force.

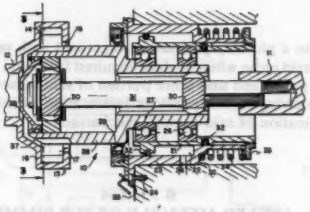
B 522,080
GEARBOX DECOUPLER

Richard N. Sullivan, Tempe, and John E. Vance, Scottsdale, both of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Nov. 8, 1974, Ser. No. 522,080
Int. Cl.² F16D 11/12, 41/00, 43/28
U.S. Cl. 192—46 14 Claims

References Cited
UNITED STATES PATENTS

1,509,446	9/1924	Skinner	192/47
1,946,177	2/1934	Neurath	192/47 X
2,548,268	4/1951	Metsger	192/85 CA X
3,395,782	8/1968	Clements	192/67 A
3,441,116	4/1969	Quenneville	192/47 X
3,715,019	2/1973	Heybourne et al.	192/67 A



1. Apparatus for coupling and decoupling driving and driven elements, comprising:

a. pawl and ratchet type clutch means having complemental parts on said driving and driven elements, at least one of said parts being provided with members movable in a plane substantially radial to the axes of said elements to engage the other part and effect a driving relation between said elements, one part of said clutch means being movable axially relative to one of said elements; and

b. means for moving said one part axially of said one element to interrupt and reestablish radial registration of said members with said other part of said clutch means.

B 530,569
METHOD AND APPARATUS FOR DETERMINING THE MECHANISM RESPONSIBLE FOR LASER-INDUCED DAMAGE

David Milam, Dublin, Calif.; Rudolph A. Bradbury, Saugus, Mass.; Richard H. Picard, Bedford, Mass., and Michael Bass, Pacific Palisades, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

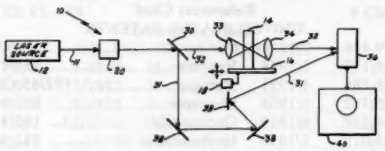
Filed Dec. 9, 1974, Ser. No. 530,569
Int. Cl.² G01N 21/16
U.S. Cl. 356—239 10 Claims

References Cited
UNITED STATES PATENTS

3,767,304	10/1973	Keenan et al.	356/237
3,811,782	5/1974	Kerr	356/201

1. An apparatus for determining the mechanism responsible for damage to a sample caused by electromagnetic radiation comprising a source for providing output pulses of smooth waveform, means located adjacent to and aligned with the output of said source for extracting square-waveform pulses from the most intense portion of said smooth pulses, means aligned with said square-waveform pulses for directing one portion of said square-waveform pulses in one direction and another portion of said square-waveform pulses in another direction, means aligned with both portions of said square-waveform pulses for receiving said pulses, means interposed between said directing means and said receiving means for

delaying said other portion of said pulses, means located between said directing means and said receiving means for moveably mounting said sample in alignment with said one portion of said pulses and means for moving said mounting



means to a plurality position in alignment with said one portion of said pulse whereby data acquired from said one portion of said pulses and said other portion of said pulses arriving at said receiving means provides information necessary in the determination of said damage mechanism.

B 531,566
ANGLED ASSEMBLY OF PCB DIMMER
Joseph P. Stefani, Warwick, R.I., assignor to General Electric Co., Providence, R.I.
Filed Dec. 11, 1974, Ser. No. 531,566
Int. Cl.² H05K 7/14
U.S. Cl. 317—120 **5 Claims**

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UNITED STATES PATENTS

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3,328,676	6/1967	Slater	315/DIG. 4
3,569,788	3/1971	Niblack	317/99
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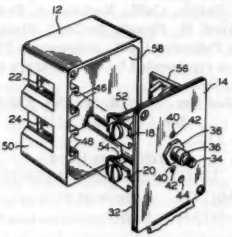

2. The dimmer construction of claim 1 in which the potentiometer and ON-OFF mechanical switch are in one housing of generally cylindrical configuration, in which a control shaft extends axially from the housing and through the mounting bracket, and in which electrical connections of said On-OFF switch extend through the printed circuit board and are longer at the potentiometer housing near the shaft and are shorter at the opposite end of the potentiometer housing.

B 535,448
AUTOMATIC CASSETTE LOADING MACHINE
James L. King, Sudbury, Mass., assignor to King Instrument Corporation, Westboro, Mass.
Filed Dec. 23, 1974, Ser. No. 535,448
Int. Cl.² B65H 19/20
U.S. Cl. 242—56 R **38 Claims**

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UNITED STATES PATENTS

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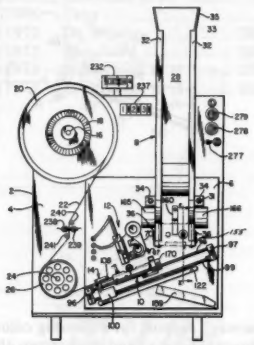
3,787,270	1/1974	King	242/56 R
3,814,343	6/1974	Bennett	242/56 R
3,825,461	7/1974	Gorman	242/56 R
3,848,825	11/1974	Zielke	242/56 R



1. An apparatus for automatically loading a plurality of cassettes having at least one rotatable spool and a leader attached to said spool with a predetermined length of tape comprising in combination:
- cassette holding means for releasably holding a cassette to be loaded in a predetermined loading position;
- means for storing a plurality of cassettes to be loaded and for advancing them one at a time to said loading position;
- means for feeding a supply of tape to be loaded;
- a splicing block means spaced from said loading position for supporting the leading end of the tape to be loaded and the leader of a cassette located at said loading position;
- reciprocally movable leader extractor means for withdrawing the leader from a cassette located at said loading position and positioning said leader on said splicing block means;
- splicing means for splicing the leading end of said tape to one section of the leader positioned on said splicing block means;
- rotatable drive means for rotating the spool of a cassette located at said loading position to wind a predetermined length of said tape on said spool;
- cutting means for severing the tape after a predetermined length thereof has been wound; and
- means for controlling operation of the foregoing means to effectuate the sequential loading of a plurality of cassettes.

B 546,922

SWIVEL AIR LOCK FOR AIRTIGHT CONNECTION BETWEEN SUBMERGIBLES

Gérald M. Boisrayon, Le Beausset; Gilbert M. Martin, La-Seyne-sur-Mer, and Jean C. Mollard, Carry-le-Rouet, all of France, assignors to Etat Francais represente par le Delegue ministeriel pour l'armement, Paris Armees, France

Filed Feb. 4, 1975, Ser. No. 546,922

Claims priority, application France, Mar. 19, 1974, 74.09160

Int. Cl.² B63G 8/24

U.S. Cl. 114—16.6 7 Claims

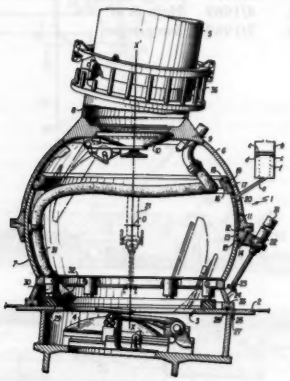
References Cited

UNITED STATES PATENTS

1,772,459	8/1930	Grieshaber	114/16.6
2,361,868	10/1944	Prassel	114/50
3,044,812	7/1962	Giovinazzo	114/16.6

FOREIGN PATENTS OR APPLICATIONS

307,654	3/1929	United Kingdom	114/16.6



1. Connecting air lock provided on a submergible device to permit the latter to connect itself in airtight fashion around an opening of an immersed enclosure, comprising

a truncated hemispherical bell adapted to be positioned around an opening of a submergible device;

a skirt having the shape of a portion of a spherical swivel joint nested in the said bell in airtight fashion with a small amount of play for articulation around a center common to said bell and said skirt, said skirt having a peripheral joint on the end face of its end outside said bell, and at the outer periphery of its end nested in said bell, a groove in which a sealing joint is placed between said skirt and said bell,

said bell having at the inner periphery of its free end a groove containing a sealing joint, the space contained between the skirt, the bell and the two sealing joints being filled with a lubricating liquid adapted to be maintained at a pressure which is slightly different from the hydrostatic pressure,

means to adjust the constant difference between the two pressures in such a manner as to cancel out the apparent weight of the swivel skirt and thus cause its hydrostatic lift in the said hemispherical bell.

B 556,496

CONTROL SYSTEM FOR STEAM FLOWRATE AND STEAM PRESSURE

Karl-Heinz Krüger, Witten, and Reinhard Altfelder, Dortmund-Mengede, both of Germany, assignors to Friedrich Uhde GmbH, Dortmund, Germany

Filed Mar. 7, 1975, Ser. No. 556,496

Claims priority, application Germany, Mar. 16, 1974, 2412804

Int. Cl.² F01K 13/02

U.S. Cl. 60—660 3 Claims

References Cited

UNITED STATES PATENTS

3,811,279	5/1974	Vogeli	60/660

FOREIGN PATENTS OR APPLICATIONS

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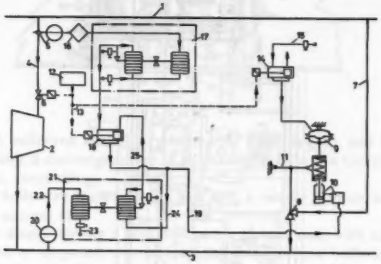

1. A control system for steam flowrate and steam pressure on a connecting line serving as a bypass between the high pressure and medium pressure steam lines in a steam system including a feed line between the high and medium pressure lines to one or more steam turbines comprising in combination,

1. a flowmeter with root extracting relay in the steam turbine feed line,
2. a pressure controller in the medium pressure line,
3. a combination quick opening and control valve having an operating lever mounted on a fixed fulcrum, said valve being interposed between said high and medium pressure steam lines,
4. a hold-down operator for said valve acting against said operating lever,
5. a spring biased positioning actuator operatively associated with said hold-down operator,
6. a change-over valve connecting said hold-down operator to a working pressure system,
7. a branch line leading from said positioning actuator,
8. a second change-over valve connected to said branch line,
9. a pressure controller having an outlet connected to said branch line,
10. a connecting line between said second change-over valve and another outlet of said last pressure controller,
11. a multiplier relay in the steam turbine feed line,
12. a line connecting the outlet of said multiplier relay and said second change-over valve, and
13. said first and second change-over valves being actuated through the turbine trip system.

B 559,697

APPARATUS FOR DISPENSING BEVERAGES

Steve W. Schwitters, Rockford, Ill., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Mar. 19, 1975, Ser. No. 559,697
Int. Cl.[2] B67D 5/56, 1/08
U.S. Cl. 222—56 20 Claims

References Cited
UNITED STATES PATENTS

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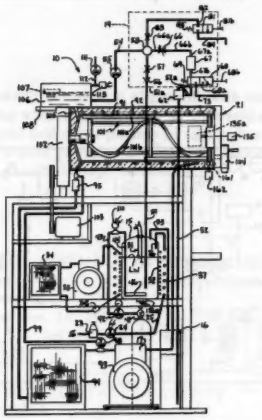
3,276,633	10/1966	Rahauser	222/129.1
3,398,550	8/1968	Lents	222/64 X
3,460,716	8/1969	Thomas	222/129.1
3,830,407	8/1974	Wierlo	222/145



1. An apparatus for dispensing beverages containing water, a flavoring syrup and food-grade gas comprising, a mixed beverage delivery line having delivery valve means movable between an open and a closed position for controlling flow of mixed beverage therethrough, water storage means for storing a quantity of water and having a water feed line, syrup storage means for storing a quantity of flavoring syrup and having a syrup feed line, water flow restricting means connecting said water feed line to said beverage delivery line, a syrup filter having a filter inlet and a filter outlet and a syrup flow restricting means connecting the filter outlet to said beverage delivery line, a syrup control valve means having a first connection to said syrup feed line; and a second connection to said filter inlet and a drain connection, said syrup control valve means including means selectively movable from a normal position communicating said first connection with said second connection while blocking flow through the drain connection and a back flush position blocking flow through the first connection while communicating the second connection with the drain connection, gas pressurizing means including a source of food-grade gas for supplying gas under a preselected substantial constant pressure to said gas inlet of said water storage means to feed water under the gas pressure through the water feed line and water flow restricting means to the beverage delivery line, said gas pressurizing means including means for supplying gas under substantially the same preselected pressure to said gas inlet of said syrup storage means to feed syrup under the gas pressure through the syrup feed line and in one direction through the filter and syrup flow restricting means to the beverage delivery line when said syrup control valve is in its normal position, said syrup control valve being operative in its back flush position to block the flow of syrup from the syrup feed line and to communicate the filter inlet with the drain connection whereby water under the gas pressure from the water feed line will flow in the other direction through the syrup flow restricting means and syrup filter to drain to back flush the same.

B 562,413

GASTIGHT LIQUID-TYPE DYNAMIC SEAL FOR CONTROL SHAFTS OF PRESSURIZED CIRCUIT INTERRUPTERS

Alain Poncet, Grenoble-Villeneuve, and Serge Roccaz, Grenoble, both of France, assignors to Merlin Gerin SA, Grenoble, France

Filed Mar. 27, 1975, Ser. No. 562,413
Claims priority, application France, Apr. 10, 1974, 74.12701
Int. Cl.[2] F16C 1/24, 33/72
U.S. Cl. 308—36.3 4 Claims

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2,288,638	7/1942	Nazro	277/135
2,518,338	8/1950	Lampe	308/36.1
2,621,087	12/1952	Kluge	308/36.3
2,799,532	7/1957	Smart	277/135
2,921,804	1/1960	Jekat	308/36.3
3,347,604	10/1967	Lavelle et al.	308/36.3
3,439,963	4/1969	Hein et al.	308/187
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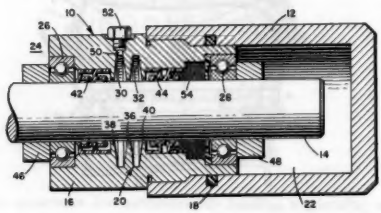

1. Gastight dynamic seal sealing the pressurized enclosure of a compressed-gas circuit interrupter to a movable control stud extending through said enclosure, comprising:

a stationary sleeve member connected in a gastight manner to said enclosure and surrounding said stud,

bearing means supporting said stud from said sleeve for free movement of said stud relative to said sleeve,

a plurality of gas-trap chambers defined between said sleeve and said stud, said chambers being spaced apart in the longitudinal direction of said stud and separated by partition wall means clearing said stud so as to leave small throttle passageways between successive chambers along said stud, and

flexible baffle joint means disposed in at least a part of said chambers and bearing against said sleeve in friction and sealing relation with said stud,

said chambers containing a viscous gas-trap liquid dissolving the gas leaking from the interior of said enclosure through said baffle joint means whereby said passageways produce a degressive concentration of the dissolved gas in successive chambers.

B 562,601

DISPENSER COMBINED WITH HANGING CLIP FOR INVERTED SUPPORT

Frank J. Mack, Kinnelon, N.J., assignor to American Home Products Corporation, New York, N.Y.

Filed Mar. 27, 1975, Ser. No. 562,601
Int. Cl.² A47K 17/02; B65D 23/12
U.S. Cl. 222—181 8 Claims

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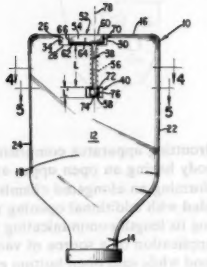
3,627,177	12/1971	Marcus et al.	222/181
3,768,684	10/1973	Buchtel	222/181 x
3,778,850	12/1973	Bryan	248/360 X
3,883,024	5/1975	Thomas	222/181 X



1. An assembly for supporting a container in an inverted position comprising:

A. a container having a discharge orifice at one end, an end wall at the opposite end, and a plurality of side walls between said ends;

1. a first recess defined in said end wall adjacent a side wall;

2. means to support a hanger device comprising second and third recesses defined in said adjacent side wall;

a. said second recess extending between said first recess and said third recess and having a predetermined depth, width and length and having outer linear ridges extending toward each other to define a linear opening narrower than the width of said second recess;

b. said third recess having a predetermined depth, width and length, said depth and width being larger than the depth and width of said second recess; and

B. a hanger device rotatably connected to said support means and further comprising;

1. a first planar portion adapted to swivel in said first recess;

2. a cylindrical shaft connected eccentrically to said first planar portion being substantially equal in length to the length of said second recess and adapted to rotate in said second recess;

3. a first flange connected to said shaft opposite said first planar portion and adapted to rotate in said third recess, said flange being wider than said second recess.

B 567,892

BELLCRANK ASSEMBLY, NOZZLE ACTUATOR

Larry E. Anders, Palm Springs, and Joel F. Sutton, Lake Park, both of Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 14, 1975, Ser. No. 567,892
Int. Cl.² B64C 15/08
U.S. Cl. 239—265.39 4 Claims

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UNITED STATES PATENTS

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FOREIGN PATENTS OR APPLICATIONS

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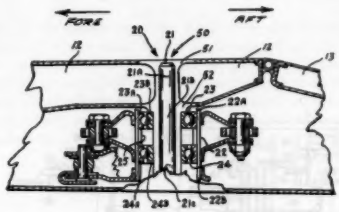


1. A bellcrank assembly, adapted for mounting on, and for actuating, a convergent flap of an exhaust nozzle of a turbojet engine, comprising:

a. a bellcrank shaft having a first end, a middle portion, and a second end;

b. a sleeve having a first end and a second end, with said sleeve disposed external of and around said bellcrank shaft, and with said sleeve so positioned that said first end of said sleeve is generally located near said middle portion of said bellcrank shaft, and said second end of said sleeve is generally located near said second end of said bellcrank shaft;

c. a first bearing member of the angular type interposed between said first end of said sleeve and said middle portion of said bellcrank shaft, with said first bearing member having two races, an inner one and an outer one, between which it is moveably positioned;

d. a second bearing member of the angular type interposed between said second end of said sleeve and said second end of said bellcrank shaft, with said second bearing member having two races, an inner one and an outer one, between which it is moveably positioned;

e. a spacer disposed between said first bearing member and said second bearing member, and abutting said outer races, with said spacer simultaneously interposed between said sleeve and said bellcrank shaft;

f. means for securing said sleeve, said first bearing member and races, said second bearing member and races, and said spacer to said bellcrank shaft;

g. a bellcrank housing subassembly, comprising:

(1) a housing suitably dimensioned and configurated to contain said sleeve, said first bearing member and races, said second bearing member and races, said spacer, and said middle portion and said second end of said bellcrank shaft;

(2) and, a fore bellcrank link arm, an aft bellcrank link arm, and a bellcrank actuator arm, with all said arms fixedly attached to said sleeve, whereby said bellcrank actuator arm is pivotally moveable;

h. means for securing said bellcrank housing subassembly at said second end of said bellcrank shaft;

i. and, means for mounting and securing said first end of said bellcrank shaft to said convergent flap of said exhaust nozzle of said turbojet engine.

B 575,583

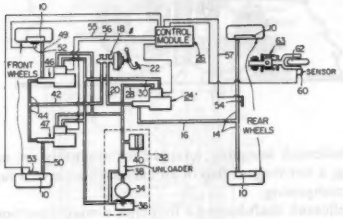
VEHICLE SKID CONTROL SYSTEM INCLUDING VEHICLE SPEED SENSOR

Yasuhisa Takeuchi, 2-31, Iriyamazu-cho, Yokosuka, and Haruhiko Iizuka, 714, Nishiterao-cho, Kanagawa, Yokohama, both of Japan

Continuation of Ser. No. 365,465, May 31, 1973, abandoned. This application May 8, 1975, Ser. No. 575,583
Int. Cl.[2] B60T 8/08
U.S. Cl. 303—21 BE 8 Claims

References Cited
UNITED STATES PATENTS

2,279,409	4/1942	Milster et al.	73/128
3,754,797	8/1973	Rodi et al.	303/21 BE
3,758,166	9/1973	Kuwana et al.	303/21 P



1. A skid control system for a motor vehicle, which comprises:
- a wheel speed sensor for generating a wheel speed signal;
- a pseudo vehicle speed signal generator for generating a pseudo-vehicle speed signal in accordance with the wheel speed signal;
- an actual vehicle speed sensor for generating an actual vehicle speed signal when energized;
- first means connected to said pseudo vehicle speed signal generator and actual vehicle speed sensor for passing therethrough the larger in amplitude of said pseudo vehicle speed signal and actual vehicle speed signal;
- a differentiator for differentiating said wheel speed signal to produce a wheel acceleration signal;
- second means connected to said first means, said wheel speed sensor and said differentiator for producing an impending skid signal in accordance with said the larger from said first means, of said wheel speed signal and the wheel acceleration signal;
- a second comparator connected to said differentiator for producing a brake release signal when said wheel acceleration signal lowers below a first predetermined level;
- a third comparator connected to said differentiator for producing a brake application signal when said wheel acceleration signal exceeds a second predetermined level;
- an actuation signal generator for producing an actuation signal in accordance with said impending skid signal, brake release signal and brake application signal;
- a brake pressure modulator for modulating the brake pressure in response to said actuation signal; and
- energizing means for energizing said actual vehicle speed sensor in response to said actuation signal or said impending skid signal.

B 581,843

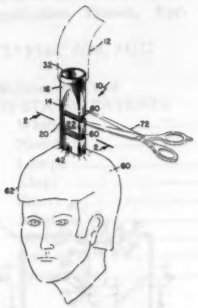
VACUUM HAIRCUTTING APPARATUS AND METHOD

Constantino J. Alevras, 542 Gruman Court, Riverdale, N.J. 07675

Filed May 29, 1975, Ser. No. 581,843
Int. Cl.[2] B26B 19/20, 19/44
U.S. Cl. 30—133 6 Claims

References Cited
UNITED STATES PATENTS

1,331,218	2/1920	Severson	30/133
2,523,201	9/1950	Ellis	30/133 X
3,654,699	4/1972	Garcia	30/133



1. Vacuum haircutting apparatus comprising an elongated hollow tapered body having an open upper end and an open bottom end and forming an elongated chamber, said tapered body being provided with additional opening means at graduated intervals along its length communicating with said chamber, so that the application of a source of vacuum suction to said open upper end while said open bottom end is applied to a subject's hair results in said hair being drawn up through said chamber whereby said hair will be cuttable through said additional opening means.

B 594,871

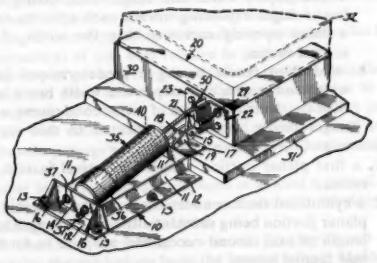
COUNTERBALANCE HINGE FOR PIVOTING LOADS

Richard C. Bue, Chaska, and Phillip L. Gorsuch, Lindstrom, both of Minn., assignors to Sico Incorporated, Minneapolis, Minn.

Filed July 10, 1975, Ser. No. 594,871
Int. Cl.[2] E05D 9/00
U.S. Cl. 16—128 R 10 Claims

References Cited
UNITED STATES PATENTS

2,779,032	1/1957	Van Der Sluys	5/164 R
3,550,167	12/1970	Bennett	5/164 R
3,828,375	8/1974	Driver	5/136 X



1. A counterbalanced folding hinge assembly comprising:
   a. a base frame member for attachment to a floor;
   b. a movable frame member for attachment to a load;

c. means pivotally mounting said movable frame member to said base frame member to permit pivoting of the load between vertical and horizontal positions;

d. counterbalance means interconnected between said base frame and movable frame for applying a bias thereto, said counterbalance means comprising:

1. a spring having one end operatively engaging one of said frame members;

2. means defining a cam surface attached to the other of said frame members;

3. a cable interconnecting the other end of said spring and said other of said frame members and engaging said cam surface, said cam surface configured to provide a large effective radius when said movable frame is in the vertical load position, and a small effective radius when said movable frame is in its horizontal load position.

B 111,130

MANUFACTURE OF NITROGEN TRIFLUORIDE

Joseph Gordon, Morris Township, Morris County, and Bernard Sukornick, Elizabeth, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed May 16, 1961, Ser. No. 111,130
Int. Cl.² C01B *21/00, 9/08*
U.S. Cl. 423—406 10 Claims

References Cited
UNITED STATES PATENTS
3,055,817 9/1962 Gordon et al. ..... 423/489 X
FOREIGN PATENTS OR APPLICATIONS
625,055 8/1961 Canada 423/406
OTHER PUBLICATIONS
Gall, J., Fluorine–Derived Chemicals as Liquid Propellants, In Ind. and Eng. Chem. Vol. 49, No. 9, 9/1957.

1. The process for making nitrogen trifluoride which comprises introducing gaseous fluorine azide into a reaction zone containing fluorinating agent of the group consisting of nitrosyl fluoride and chlorine trifluoride, maintaining temperature in the reaction zone in the range of above the boiling point of fluorine azide and below about 100° C., and discharging from the reaction zone gaseous reaction products containing nitrogen trifluoride.

B 257,143

POLYMER COMPOSITION

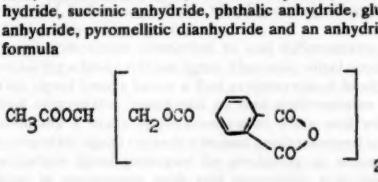
Terence John Henman, Haslingfield, and Graham Williams, Runcorn, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 26, 1972, Ser. No. 257,143
Claims priority, application United Kingdom, May 28, 1971, 17712/71; Aug. 27, 1971, 40273/71
Int. Cl.² C08K *3/24, 7/14, 9/06*
U.S. Cl. 260—42.15 12 Claims

References Cited
UNITED STATES PATENTS
3,437,550 4/1969 Paul ..... 260/41 AG
3,471,439 10/1969 Bixler et al. 260/41
3,694,403 9/1972 Aishima et al. ..... 260/41 R
FOREIGN PATENTS OR APPLICATIONS
1,095,700 12/1967 United Kingdom ..... 260/41 AG

1. A polymeric composition consisting essentially of a blend of

a. at least one compound which is a carboxylic acid or a carboxylic acid anhydride selected from the group consisting of lactic acid, oxalic acid, malonic acid, succinic acid, adipic acid, maleic acid, fumaric acid, itaconic acid, tartaric acid, phthalic acid, citric acid, thiodipropionic acid, nitrilotriacetic acid, benzoic anhydride, maleic anhydride, succinic anhydride, phthalic anhydride, glutaric anhydride, pyromellitic dianhydride and an anhydride of formula



and

b. a graft copolymer of an unsaturated dicarboxylic acid or the anhydride of an unsaturated dicarboxylic acid and a propylene polymer wherein in the blend of (a) and (b), 1–90% of the functions

contained in the acid and/or anhydride groups of the blend are present in the acid or anhydride component of the graft copolymer which is component (b) of the blend and wherein the acid or anhydride which is present in the graft copolymer is different from any acid or anhydride which is present as component (a) of the blend.

B 271,743

COPOLYMERISATION OF OLEFINS

Ronald John Wyatt, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed July 14, 1972, Ser. No. 271,743
Int. Cl.² C08F *210/00, 212/00*
U.S. Cl. 260—80.78 12 Claims

References Cited
UNITED STATES PATENTS
3,300,459 1/1967 Natta et al. 260/88.2
3,326,883 6/1967 Kelley et al. 260/94.9
FOREIGN PATENTS OR APPLICATIONS
1,314,828 4/1973 United Kingdom
2,040,353 2/1971 Germany
951,022 3/1964 United Kingdom
OTHER PUBLICATIONS
Natta et al., in "Polymer Chemistry of Synthetic Elastomers," Part II, (Interscience, 1969), p. 683.

1. A process for the preparation of an amorphous, vulcanisable, elastomeric copolymer of ethylene and propylene in a proportion in the range 20:80 to 80:20 parts by mole by copolymerisation of ethylene and propylene in the presence of, as polymerisation catalyst, a transition metal composition which is the product of reacting a transition metal complex of the general formula

$$R_mMX_p \qquad (1)$$

with a substantially inert matrix material having a hydroxylic surface which is free from adsorbed water, wherein M is a transition metal of Groups IVA to VIA of the Periodic Table of the Elements, R is a hydrocarbon group or substituted hydrocarbon group, X is a monovalent ligand and m and p are integers, m having a value from 2 to the highest valency of the metal M, and p having a value from 0 to 2 less than the valency of the metal M, the copolymerisation process being effected at a temperature in the range of 10° to 80°C in a diluent consisting essentially of propylene or mixture thereof with another α-olefin which is in liquid form under the prevailing polymerisation conditions and in which the catalyst and copolymer are insoluble.

B 330,719

CENTRIFUGAL TREATMENT OF FLUIDS

Ernst-August Bielefeldt, Neumunster, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH - Division Hamburger Flugzeugbau, Hamburg, Germany

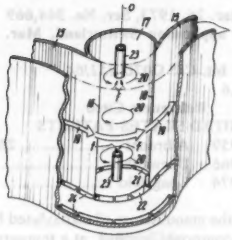
Filed Feb. 8, 1973, Ser. No. 330,719
Int. Cl.² B01D 21/26
U.S. Cl. 210—512 R 12 Claims

References Cited
UNITED STATES PATENTS

430,444	6/1890	Smith	55/461 X
535,099	3/1895	Gale et al.	55/461
1,660,687	2/1928	Stebbins	209/144
2,767,840	10/1956	Dobson et al.	209/144
2,816,490	12/1957	Boadway et al.	210/512
2,967,618	1/1961	Vane	210/84
3,672,503	6/1972	Mark	209/144
3,789,988	2/1974	Valibouse et al.	210/512 X

FOREIGN PATENTS OR APPLICATIONS

231,156	5/1910	Germany	55/461



1. An apparatus for centrifugally treating a fluid, comprising conduit means forming a curved channel of substantially rectangular cross-section connected to a source of fluid to be treated for traversal by said fluid at high speed, said conduit means being provided at a concave side of said channel with at least one transverse recess extending across the full width of said channel, said recess being partly separated from said channel by a transverse upstream edge overhanging said recess and by a transverse downstream edge confronting the oncoming fluid stream, and extraction means opening into said recess adjacent a centerline thereof for axially removing a portion of a body of fluid circulating in said recess, the cross-section of said channel being larger at said upstream edge than at said downstream edge, said recess having a generally part-cylindrical periphery extending over an arc of at least 180°, said channel being fully open toward said recess over a complementary arc lying between said upstream and downstream edges, at least said upstream edge forming an acute vertex angle pointed in a direction tangent to said complementary arc.

B 333,110

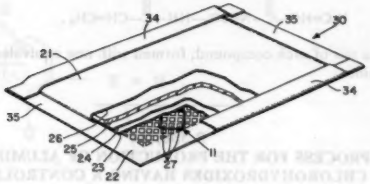
ABSORPTIVE DEVICES HAVING POROUS BACKSHEET

James Bryant Sisson, Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 16, 1973, Ser. No. 333,110
Int. Cl.² A61F 13/18, 13/20; A61L 15/03; B32B 3/10
U.S. Cl. 428—132 17 Claims

References Cited
UNITED STATES PATENTS

2,027,810	1/1936	Cooper	428/132
2,570,011	10/1951	Stemberger	128/287
3,156,242	11/1964	Crowe, Jr.	128/296
3,231,454	1/1966	Williams	161/113
3,292,619	12/1966	Egler	128/156
3,426,754	2/1969	Bierenbaum et al.	128/156
3,446,208	5/1969	Fukuder	161/112
3,546,327	12/1970	Rude	161/110
3,628,720	12/1971	Schnedding	161/112



1. An absorptive device, comprising:
an absorbent body; and
a backsheet of a material having the characteristics of polyethylene film in direct contact with and substantially entirely underlying the absorbent body;
the backsheet having a plurality of tapered hollow bosses therein extending towards the absorbent body with each boss having an aperture extending through the apex thereof forming a tapered pore in the backsheet which enlarges in a direction away from the absorbent body;
the dimension of the pores being selected so that, when the absorptive device is placed to receive liquids such as discharges from a human body with the absorbent body positioned between the human body and the backsheet, the liquids absorbed by the absorbent body and contained within the absorptive device are blocked from passage through the backsheet while vapors pass readily through the pores of the backsheet.

B 333,247
PROCESS FOR CROSSLINKING HYDROPHILIC COLLOIDS USING VINYL SUBSTITUTED, SO_2 CONTAINING, AMINE SALT

Rolf Kyburz, Marly, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Feb. 16, 1973, Ser. No. 333,247

Claims priority, application Switzerland, Feb. 25, 1972, 2722/72

Int. Cl.² C09H 7/00; C08F 116/06

U.S. Cl. 260—117 **5 Claims**

References Cited

UNITED STATES PATENTS

2,579,871	12/1951	Schoene	260/117 X
2,994,611	8/1961	Heyna et al.	260/117 X
3,061,436	10/1962	Himmelman et al.	260/117 X
3,455,892	7/1969	Froehlich	260/117
3,455,893	7/1969	Froehlich	260/117
3,551,159	12/1970	Froehlich	260/117 X
3,642,486	2/1972	Burness et al.	260/117 X

FOREIGN PATENTS OR APPLICATIONS

1,175,547	8/1964	Germany	96/111
994,869	6/1965	United Kingdom	96/111
1,953,920	5/1971	Germany	

OTHER PUBLICATIONS

Chem. Abstracts. Vol. 68, 1968, 3531 p. Nishio et al.

1. Process for crosslinking hydrophilic colloids which contain amino-, imino- and/or hydroxyl groups, which process comprises employing as crosslinking agent a compound of the formula

or a salt of such compound, formed with one equivalent of an amine.

B 336,754
PROCESS FOR THE PRODUCTION OF ALUMINUM CHLOROHYDROXIDES HAVING A CONTROLLED CHLORINE CONTENT

Bruno Notari, and Luigi Rivola, both of San Donato Milanese, Italy, assignors to Snam Progetti, S.p.A., San Donato Milanese, Italy

Filed Feb. 28, 1973, Ser. No. 336,754

Claims priority, application Italy, Mar. 1, 1972, 21251/72

Int. Cl.² C01F 7/00, 7/48, 7/56; C01C 1/16

U.S. Cl. 423—462 **1 Claim**

References Cited

UNITED STATES PATENTS

2,256,505	9/1941	Thompson	424/68
2,876,163	3/1959	Garizio et al.	423/462 X

FOREIGN PATENTS OR APPLICATIONS

655,617	7/1951	United Kingdom	423/495

OTHER PUBLICATIONS

Tanabe, "American Perfumer And Cosmetics," Vol. 77, pp. 25–30, (Aug., 1962).

Edwards, "The Aluminum Industry," Vol. I, 1st Edition, p. 172, (1930).

1. The process for preparing, as end product, aluminum chlorohydroxide represented by the formula, $Al_x(OH)_yCl$, which consists in reacting an aluminum compound having a particle diameter of 500–4000A selected from the group consisting of bayerite, gibbsite, diaspore and boehmite with 37% hydrochloric acid in aqueous solution at a temperature of 110°–150°C in the presence of an inert gas atmosphere of from 0.8 to 1.5 kg/cm² and under strong mechanical stirring of the reactants for a period of 4 hours to form aluminum chlorohydroxide represented by the formula, $Al_x(OH)xCly$ wherein the values of *x* and *y* range from 2.5 to 3.5 and from 3.5 to 2.5 respectively, then neutralizing said aluminum chlorohydroxide with aqueous or gaseous anhydrous ammonia to establish a pH in the solution in the range between 2.7 and 3.1 at a temperature of 65°–75°C under strong mechanical stirring conditions to prevent the precipitation of alumina gel and then separating ammonium chloride by crystallization in the form of macrocrystals having dendrite branching and thereafter recovering said aluminum chlorohydroxide.

B 344,669
PRODUCTION OF ALKOXYLATED N-METHYLOL COMPOUNDS

Jürg Merz, Therwil, and Luzius Schibler, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 26, 1973, Ser. No. 344,669

Claims priority, application Switzerland, Mar. 28, 1972, 4632/72

Int. Cl.² C07D 251/64

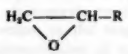
U.S. Cl. 260—249.6 **14 Claims**

References Cited

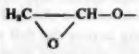
UNITED STATES PATENTS

2,892,810	6/1959	Albrecht	260/249.6 X
3,277,021	10/1966	Daendliker	260/2
3,812,122	5/1974	Lengsfeld	260/249.6

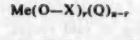
1. A process for the manufacture of alkoxylated N-methylol compound, which comprises reacting, at a temperature of 10 to 160°C and a pressure of 1 to 20 atmospheres gauge; (a) a N-methylolatedamino triazine with (b) an alkylene oxide of the formula



wherein R is hydrogen, alkyl with 1 to 3 carbon atoms, phenyl or a



radical, in the presence of (c) at least one metal alcoholate of the formula



wherein Me is a n-valent transition metal of groups IV, V or VI of the periodic system, X is alkyl with 1 to 4 carbon atoms, halogenoalkyl with 2 to 4 carbon atoms, phenyl, benzyl or cycloalkyl with at most 12 ring carbon atoms, Q is halogen or alkoxy with 1 to 4 carbon atoms, r is 1 to *n* and *n* denotes 4, 5, or 6, or in the presence of said component (c) together with (d) at least one alkali metal hydroxide or one alkali metal alcoholate of an alkanol with 1 to 4 carbon atoms.

B 372,232
WETTABLE NON-WOVEN STRUCTURES AND COMPONENTS THEREOF

Burnett H. Johnson, 4800 St. Andrews, and Terrence Huff, 5107 Inverness, both of Baytown, Tex. 77520

Continuation-in-part of Ser. No. 149,677, June 3, 1971, Pat. No. 3,765,948. This application July 26, 1973, Ser. No. 372,232

Int. Cl.² D06B *1/00*

U.S. Cl. 8—115.5 **15 Claims**

References Cited

UNITED STATES PATENTS

2,869,435	1/1959	Sands	162/157 R
3,016,599	1/1962	Perry	162/157 R
3,067,087	12/1962	Gorski et al.	162/157 R
3,228,744	1/1966	Karn	8/115.5
3,470,287	9/1969	Landauer	264/184
3,704,198	11/1972	Prentice	161/170
3,765,948	10/1973	Johnson et al.	136/146

FOREIGN PATENTS OR APPLICATIONS

952,111	3/1964	United Kingdom

1. An improved process for preparing wettable and rewettable polyolefin non-woven mats which comprises:

contacting a non-wettable non-woven mat of polyolefin fibers having a porosity greater than 40 percent with a gaseous sulfur dioxide-chlorine mixture in the presence of ultraviolet light under conditions to obtain at least 1.0 weight percent sulfur in said mat.

B 407,014
1-ALKOXYCARBONYL-2-(BIS-(ALKOXYCARBONYL)-AMINO)-BENZIMIDAZOLES

Karl Heinrich Mayer, Opladen; Ferdinand Grewe, Burscheid, and Paul-Ernst Frohberger, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 16, 1973, Ser. No. 407,014

Claims priority, application Germany, Oct. 31, 1972, 2253324

Int. Cl.² C07D *235/04*

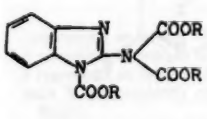
U.S. Cl. 260—309.2 **7 Claims**

References Cited

UNITED STATES PATENTS

3,427,388	2/1969	Scoggin	424/273

1. A 1-alkoxycarbonyl-2-[bis-(alkoxycarbonyl)-amino]-benzimidazole of the formula



in which

each R independently is slower alkyl.

B 407,205
DYEING CELLULOSE WITH AMINONAPHTHYL AZOBENZENE VINYL TYPE REACTIVE DYES

Fritz Meininger, Frankfurt am Main; Ludwig Schlafer, Fischbach, Taunus, and Maria Kallay, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 160,153, July 6, 1971, abandoned. This application Oct. 17, 1973, Ser. No. 407,205

Claims priority, application Germany, July 8, 1970, 2033784

Int. Cl.² D06P *3/00*

U.S. Cl. 8—1 E **17 Claims**

References Cited

UNITED STATES PATENTS

3,223,470	12/1965	Boedeker et al.	8/54
3,457,251	7/1969	Meininger	260/148
3,462,409	8/1969	Meininger	260/147

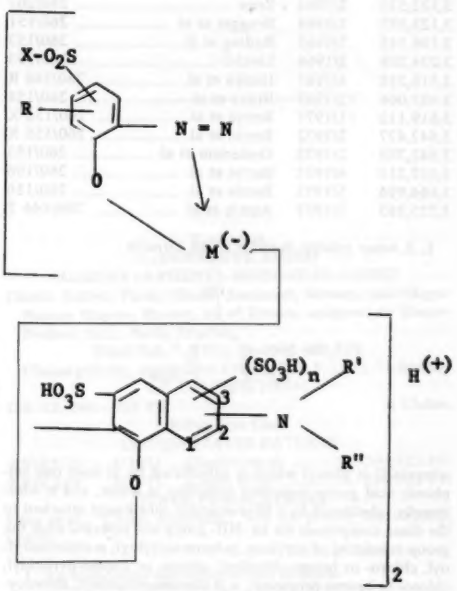
FOREIGN PATENTS OR APPLICATIONS

1,126,542	3/1962	Germany	260/151

OTHER PUBLICATIONS

Maerz & Paul Dictionary of Color, pp. 98–99, Pub. 1950 by McGraw Hill Co., N.Y.C., pp. 98–99.

1. A process for the manufacture of fast prints on fibrous materials consisting of or containing cellulose which comprises applying symmetrical metal-containing reactive dyestuffs of the general formula



(I)

in which M represents a cobalt or chromium atom, R represents hydrogen, chlorine, bromine, nitro, amino, acetylamino or a lower alkyl or alkoxy group containing 1 to 4 carbon atoms, R′ represents hydrogen or alkyl of 1 to 4 carbon atoms, R″ represents hydrogen, alkyl of 1 to 4 carbon atoms or phenyl, and wherein the moiety —NR′R″ in the formula is substituted in the 2 or 3 position of the naphthol component, *n* is zero or 1 and X represents the vinyl radical or a group of the formula $-CH_2-CH_2-Y$ in which Y is halogen, sulfuric acid ester, thiosulfuric acid ester, phosphoric acid ester, di-

methylamino or diethylamino, on said fibrous materials and fixing them by means of inorganic alkaline agents or by the action of heat at temperatures up to 200°C.

B 411,624

WATER-SOLUBLE, FIBER-REACTIVE PHENYLAZODIHYDROXY, METHYL, CYANOPYRIDINE DYESTUFFS

Arthur Buehler, Rheinfelden; Alfred Fasciati, Bottmingen, and Gerd Hoelzie, Liestal, all of Switzerland, assignors to Ciba Ltd. now Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 200,210, Nov. 18, 1971, abandoned, which is a continuation of Ser. No. 840,036, July 8, 1969, abandoned. This application Nov. 1, 1973, Ser. No. 411,624

Claims priority, application Switzerland, July 15, 1968, 10521/68

Int. Cl.² C09B *62/08, 62/24, 62/50;* **D06P** *3/58*

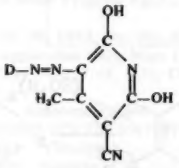
U.S. Cl. 260—156 **4 Claims**

References Cited

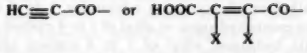
UNITED STATES PATENTS

3,121,712	2/1964	Berrie et al.	260/146 T
3,122,533	2/1964	Senn	260/207
3,123,595	3/1964	Brugger et al.	260/151
3,196,145	7/1965	Reding et al.	260/153
3,234,208	2/1966	Liechti	260/193
3,316,238	4/1967	Hanke et al.	260/146 R
3,487,066	12/1969	Ritter et al.	260/156
3,619,112	11/1971	Berrie et al.	260/156 X
3,642,427	2/1972	Berrie et al.	260/156 X
3,642,765	2/1972	Oesterlein et al.	260/153
3,657,214	4/1972	Berrie et al.	260/156
3,664,996	5/1972	Berrie et al.	260/156
3,725,383	3/1973	Austin et al.	260/146 T

1. A water soluble dyestuff of the formula



wherein D is phenyl which is substituted by at least one sulphonic acid group imparting solubility in water, and is additionally substituted by a fiber-reactive substituent attached to the diazo component via an -NH- group and selected from the group consisting of acryloxy, α-bromoacryloyl, α-chloroacryloyl, chloro- or bromo- triazinyl, chloro- or bromo-pyrimidyl, chloro- or bromo-propionyl, α,β-dibromopropionyl, fluorocyclobutanecarbonyl, chloroquinoxalinecarbonyl, methanesulphonylpyrimidinyl and a group of the formula



in which one of the symbols X represents hydrogen and the other chlorine or bromine; and said phenyl is further unsubstituted or substituted by at least one member selected from the group consisting of hydroxy, cyano, 4-methyl-3-sulfophenylsulfonyl, sulphamide, nitro, chloro, methoxy and acetylamino.

B 416,257

PRODUCTION OF 3-MONOCHLORO-2,4,5-TRIALKYLBENZOPHENONES AND 3,6-DICHLORO-2,4,5-TRIALKYLBENZOPHENONES

Ernst Schaffner, Ludwigshafen; Heinz Eilingsfeld, Frankenthal; Ernst Schefczik, and Manfred Patsch, both of Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 15, 1973, Ser. No. 416,257

Claims priority, application Germany, Nov. 18, 1972, 2256662

Int. Cl.² C07C *49/80*

U.S. Cl. 260—591 **8 Claims**

References Cited

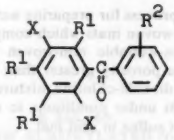
UNITED STATES PATENTS

2,012,301	8/1935	Clark et al.	260/591

OTHER PUBLICATIONS

Dokunikhin et al., Chem. Abstracts, 66, 104844g (1967).

1. A 3,6-dichloro-2,4,5-trialkylbenzophenone of the formula



in which the individual radicals R^1 may be identical or different and each is alkyl, R^2 is hydrogen or halogen and X is chloro.

B 420,176

PROCESS FOR THE PHOTOPOLYMERISATION OF ETHYLENICALLY UNSATURATED COMPOUNDS

Niklaus Baumann, Fribourg, and Hans-Peter Schlunke, Marly, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Nov. 29, 1973, Ser. No. 420,176

Claims priority, application Switzerland, Dec. 5, 1972, 17658/72

Int. Cl.² G03C *1/70*

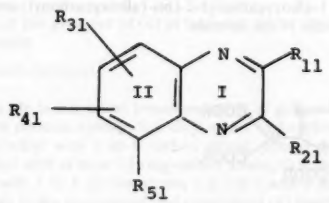
U.S. Cl. 96—35.1 **14 Claims**

References Cited

UNITED STATES PATENTS

3,531,282	9/1970	Miller et al.	96/115 P
3,765,898	10/1973	Bauer et al.	96/115 P

1. Process for the photopolymerisation of ethylenically unsaturated monomers which contain terminal $H_2C=$ groups and are water-soluble with the aid of at least one photoredox pair, which comprises employing as redox pair, on the one hand, a diazine compound of the formula



wherein

R_{11} and R_{31} denote a phenyl radical, a benzoyl radical, a phenylsulphonic acid group a methyl group or a hydrogen atom, or

R_{11} and R_{21} together with two carbon atoms of the ring I denote a five-membered or six-membered heterocyclic and

R_{31}, R_{41} and R_{51} denote a hydrogen atom, or lower alkyl group, a chlorine atom, a nitro group, a primary amino group, an acylamino group, a trimethylammonium group, a carboxylic acid amide group which is not substituted further or is substituted further by one to two lower alkyl groups, a carboxylic acid group, carboxylic acid methyl ester group or carboxylic acid ethyl ester group or sulphonic acid group, or two of R_{31}, R_{41} and R_{51} together with two adjoining carbon atoms of the ring II denote an heterocyclic ring, and on the other hand, an electron donor, and using for the photopolymerisation a radiation which lies in the range of 200 to 450 nm.

B 435,617

SUBSTITUTED PYRIMIDINYLOXY(THIO)PHENYL UREAS AND DERIVATIVES THEREOF

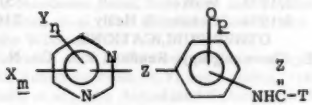
Howard Johnston, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 22, 1974, Ser. No. 435,617

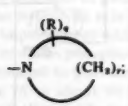
Int. Cl.² C07D *239/34*

U.S. Cl. 260—256.4 C **16 Claims**

1. A compound corresponding to the formula:



wherein:

T is or  ;

r represents an integer of 4 or 5;

q represents an integer of 0 to 2, inclusive;

p represents an integer of 0 or 1;

each X independently represents bromo, chloro, iodo or fluoro;

m represents an integer of 0 to 3, inclusive;

each Y independently represents cyano, nitro, ZR^3, $-C(X')_3$ or

;

n represents an integer of 0 to 2, inclusive, the sum of m + n being from 0 to 3, inclusive;

each Z independently represents oxygen or sulfur;

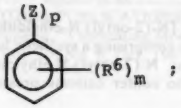
Q represents methyl, ethyl, halo, nitro, cyano or trifluoromethyl;

each X' independently represents hydrogen or halo;

each R independently represents hydrogen or alkyl of from 1 to 3 carbon atoms;

R^1 represents hydrogen, alkyl of from 1 to 4 carbon atoms or alkoxy of from 1 to 4 carbon atoms;

R^2 represents alkyl of from 1 to 3 carbon atoms or

 ;

R^3 represents alkyl of from 1 to 3 carbon atoms;

R^4 and R^5 each independently represent hydrogen or alkyl of from 1 to 4 carbon atoms; and

each R^6 represents halo or alkyl of from 1 to 3 carbon atoms.

B 440,548

3-(ISOPROPYL AMINO ALKOXY)-2-PHENYL-ISOINDOLIN-1-ONES

Claude Cotrel, Paris; Claude Jeanmart, Brunoy, and Mayer Naoum Messer, Bievres, all of France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed Feb. 7, 1974, Ser. No. 440,548

Claims priority, application France, Feb. 8, 1973, 73.04460

Int. Cl.² C07D *209/46*

U.S. Cl. 260—325 PH **6 Claims**

References Cited

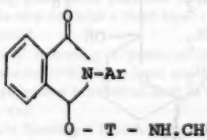
UNITED STATES PATENTS

3,818,011	6/1971	Challier et al.	260/325 PH
3,898,232	8/1975	Cotrel et al.	260/325 PH

OTHER PUBLICATIONS

Usov et al., "Chem. Abstracts," Vol. 72, p. 370, No. 90230p, (1970).

1. An isoindoline derivative of the formula:



wherein Ar is phenyl and T is alkylene of 2 through 6 carbon atoms, and non-toxic pharmaceutically-acceptable acid addition salts thereof.

B 441,723

EXTREME PRESSURE ADDITIVE FOR LUBRICANTS

Richard A. Gencarelli, Cheshire; Keith A. Hughes, Naugatuck, and John F. Sierakowski, Watertown, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Feb. 11, 1974, Ser. No. 441,723
Int. Cl.² C10M 1/38, 1/54
U.S. Cl. 252—33.6 4 Claims

References Cited
UNITED STATES PATENTS

2,492,314	12/1949	Olin et al.	260/446 X
3,139,405	6/1964	Farmer et al.	252/33.6
3,317,575	5/1967	Breindel et al.	260/446 X
3,355,472	11/1967	Remes et al.	260/446
3,707,498	12/1972	Milsom	252/33.6

OTHER PUBLICATIONS
Chem. Abstracts, V 66, 97175j, (1967).

1. Antimony tris [N-(2-octyl)-N-ethyldithiocarbamate].

2. A composition comprising a synthetic lubricant in admixture with antimony N-(2-octyl)-N-ethyldithiocarbamate in amount sufficient to confer extreme pressure properties on the lubricant.

B 450,701

STEROID TOTAL SYNTHESIS PROCESS UTILIZING A CYANOALKYL A-RING PRECURSOR

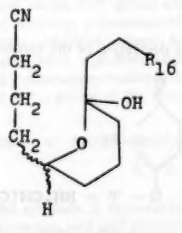
Noal Cohen, Montclair; Michael Rosenberger, Caldwell, and Gabriel Saucy, Essex Fells, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 67,296, Aug. 26, 1970, Pat. No. 3,813,417.
This application Mar. 13, 1974, Ser. No. 450,701
Int. Cl.² C07D 309/22
U.S. Cl. 260—345.9 3 Claims

References Cited
UNITED STATES PATENTS

3,700,661	10/1972	Saucy et al.	260/345.3 X
3,816,458	6/1974	Saucy	260/345.9

1. The compound of the formula



where R_{16} is selected from the group consisting of di(lower alkyl) amino and desoxyephedrine.

B 450,870

SUBSTITUTED 2-ARYLQUINAZOLINES AS FUNGICIDES

Wayne Nelson Harnish, Medina, and Arthur Albert Ramsey, Middleport, both of N.Y., assignors to FMC Corporation, Philadelphia, Pa.

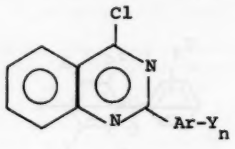
Filed Mar. 13, 1974, Ser. No. 450,870
Int. Cl.² A01N 9/22
U.S. Cl. 424—251 13 Claims

References Cited
UNITED STATES PATENTS

1,880,447	10/1932	Hentrich et al.	260/251 QA
3,755,582	8/1973	Bullock	424/251

OTHER PUBLICATIONS
Chemical Abstracts, Vol. 55 (1961), p. 1009h.
Chemical Abstracts, Vol. 76 (1972), p. 149497u.

1. A fungicidal composition which comprises, as active ingredient, a fungicidally effective amount of a quinazoline of the formula:



wherein Ar is phenyl or thienyl; Y is halogen or alkyl of 1 to 4 carbons; and *n* is 0 or 1; with the proviso that when Ar is phenyl and Y is chlorine, Y is in the 3- or 4-position of the phenyl ring; in admixture with an agriculturally acceptable carrier, and a surface-active agent.

B 452,501

DUAL TEMPERATURE GRADIENT ELUTION LIQUID CHROMATOGRAPHY

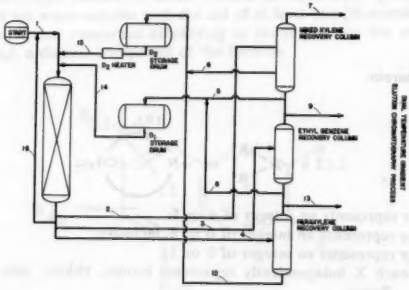
Paul R. Geissler, 2 Whitehall Ave., Edison, N.J. 08817, and Robert P. Cahn, 799 Ridgewood Road, Millburn, N.J. 07041

Filed Mar. 19, 1974, Ser. No. 452,501
Int. Cl.² B01D 15/08
U.S. Cl. 210—24 10 Claims

References Cited
UNITED STATES PATENTS

3,654,145	4/1972	Baunnock et al.	55/67 X
3,719,084	3/1973	Walker	55/197 X
3,835,043	9/1974	Geissler & Healy	210/31 C

OTHER PUBLICATIONS
Heftmann, E. *Chromatograpy*, Reinhold Pub. Co. N. Y., p. 186, 1961.



1. In a liquid chromatographic separation process of up to

two components contained in admixture in a feedstream including the steps of:

a. contacting the feedstream mixture containing said components to be separated with a bed of crystalline aluminosilicate adsorbent at conditions to effect the selective retention of up to two of the components by said adsorbent;

b. passing through said bed an eluent selected from the group consisting of aromatics and substituted aromatics;

c. increasing the strength of the eluting agent during the operation of step (b) above to thereby effect desired separation under conditions that cause low elution volume to feed ratios;

d. recovering from said bed a stream or streams containing a portion of the less preferentially adsorbed components; and

e. recovering a stream or streams substantially enhanced in concentration of said selectively adsorbed components relative to other feedstream components wherein the improvement comprises preheating the eluting agent of step (c) above prior to passing it through said bed at temperatures of from about 160° to about 200°C to thereby effect the desired separation of one of said preferentially adsorbed components under conditions resulting in substantially lower elution volume to feed ratios without a corresponding substantial decrease in the separation of the other of said preferentially adsorbed components.

B 452,879
METHOD FOR DETERMINATION OF TRIGLYCERIDES AND GLYCEROL

William S. Stavropoulos, Carmel, and Robert D. Crouch, Indianapolis, both of Ind., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 20, 1974, Ser. No. 452,879
Int. Cl.² C12K *1/04*; G01N *31/00*
U.S. Cl. 195—103.5 R **11 Claims**

References Cited
UNITED STATES PATENTS

3,703,591	11/1972	Bucolo et al.	195/103.5 R
3,791,931	12/1974	Thum et al.	195/103.5 R

OTHER PUBLICATIONS

Otto Wieland, Methods of Enzymatic Analysis, pp. 211–214, Academic Press, New York and London, 1965.

S. P. Colonick et al., Methods in Enzymology, XIV, pp. 628–630, Academic Press, New York and London, 1969.

T. P. Hilditch et al., The Chemical Constitution of Natural Fats, John Wiley & Sons Inc., N.Y., 1964.

S. P. Colowick et al., "Methods in Enzymology," XIV, pp. 627–630, Academic Press, N.Y. and London, 1969.

S. Klotzsch et al., "An Automated Colorimetric Method for the Specific Determination of Serum Triglycerides," Abstract CC31, Technicon International Congress, Advances in Automated Analysis, Technicon Instruments Corporation, Tarrytown, N.Y., (1972).

1. In a method for determination of triglycerides in biological fluids by hydrolyzing the triglycerides to produce glycerol and quantitatively analyzing the hydrolysis mixture to determine the glycerol content, the improvement which comprises mixing a biological fluid which contains phospholipids with an alkali metal hydroxide and methanol to provide a hydrolysis mixture containing from about 75 to about 99.8 percent by weight of the methanol and an alkali metal hydroxide concentration of from about 0.15 to about 0.45 Normal; holding the resulting hydrolysis mixture for a time of from about 1 to about 20 minutes sufficient to hydrolyze triglycerides, and thereafter quantitatively determining the glycerol content of the resulting hydrolysis mixture.

9. The method of claim 8 wherein the mixture is held for about 10 minutes at about 37°C.

B 453,031
METHOD OF MANUFACTURING THIN-FILM FIELD-EMISSION ELECTRON SOURCE

Shigeo Fukase, Uenohara, and Ushio Kawabe, Hamura, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

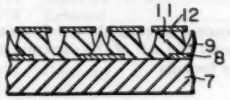
Filed Mar. 20, 1974, Ser. No. 453,031
Claims priority, application Japan, Mar. 22, 1973, 48-31759
Int. Cl.² C23F *1/04*; A47B *88/00*
U.S. Cl. 156—3 **20 Claims**

References Cited
UNITED STATES PATENTS

3,475,664	10/1969	De Vries	156/17
3,506,506	4/1970	Pennebaker, Jr.	156/17
3,531,857	10/1970	Iwamatsu	29/583
3,665,241	5/1972	Spindt et al.	313/309
3,700,510	10/1972	Keene et al.	156/17
3,755,704	8/1973	Spindt et al.	313/309

OTHER PUBLICATIONS

IBM Tech. Discl. Bulletin, "Fabricating Monolithic Circuits," J. Gardiner et al., Vol. 10, No. 5, Oct. 1967, pp. 655–656.



1. A method of manufacturing a thin-film field-emission electron source, comprising the steps of:

a. selectively forming a first layer of electrically conductive material on the surface of a substrate;

b. forming a second layer of electron emissive material over the entire surface of said substrate and said selectively formed first layer;

c. selectively removing prescribed portions of said second layer of material, so as to leave at least one emitter tip portion of electron emissive material having a prescribed shape on said first layer;

d. replacing prescribed portions of said second layer removed in step (c) with a third layer of electrically insulating material;

e. selectively removing a predetermined portion of said third layer around said at least one emitter tip portion to expose at least a portion of said at least one emitter tip portion; and

f. selectively forming a fourth layer of electrically conductive material on the surface of said third layer at locations other than the area directly overlying the top of said at least one emitter tip portion to porvide an accelerating anode layer on said third layer.

B 455,486
PREPARATION OF O,S-DIMETHYL-THIOL-PHOSPHORIC ACID DIESTER-AMIDE

Wolfgang Hofer, Wuppertal, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 303,302, Nov. 2, 1972, Pat. No. 3,845,170.
This application Mar. 27, 1974, Ser. No. 455,486
Claims priority, application Germany, Nov. 16, 1971, 2156718
Int. Cl.² C07F 9/24
U.S. Cl. 260—984 **3 Claims**

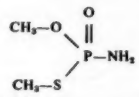
References Cited
UNITED STATES PATENTS

2,434,357	1/1948	Fischer	260/988 X
3,167,574	1/1965	Brown et al.	260/988 X

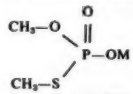
OTHER PUBLICATIONS

Kosolapoff, Organosphosphorus Compounds, John Wiley & Sons, Inc., New York, (1950), p. 294.
Arbuzov et al., Bull. Acad. Sci. USSR, Div. Chem. Sci., 1954, pp. 909–912.
Houben–Weyl, Methoden des Organischen Chemie, 1964, p. 404.

1. A process for the production of O,S-dimethyl-thiol-phosphoric acid diesteramide of the formula



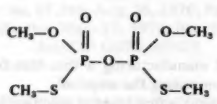
which comprises reacting about 1.3 moles of phosgene with about 2 moles of a salt of O,S-dimethyl-thiolphosphoric acid ester of the formula



in which

M is an alkali metal of ammonium,

at about 20° to 60°C in the presence of a diluent to form tetramethyl-dithiolpyrophosphoric acid ester of the formula



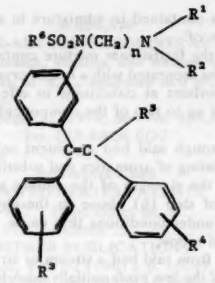
and contacting the tetramethyl-dithiolpyrophosphoric acid ester in an inert diluent with ammonia.

B 457,931
ALKANESULFONAMIDO TRIPHENYLETHYLENES

William E. Kreighbaum, Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

Filed Apr. 4, 1974, Ser. No. 457,931
Int. Cl.² C07D 295/14
U.S. Cl. 260—247.1 R **12 Claims**

1. A compound selected from the group consisting of bases having the formula



and the pharmaceutically acceptable acid addition salts thereof wherein

R^1 and R^2 are lower alkyl having 1 to 4 carbon atoms, or together with the nitrogen atom to which they are attached form a heterocyclic ring selected from the group consisting of morpholine, thiamorpholine, aziridine, pyrrolidine, piperidine, hexahydroazepine, and octahydroazocine,

R^3 and R^4 are selected from the group consisting of hydrogen, hydroxy and methoxy,

R^5 is selected from the group consisting of hydrogen, chlorine, bromine, iodine, nitro, alkyl having 1 to 4 carbon atoms and perfluoroalkyl having 1 to 4 carbon atoms,

R^6 is lower alkyl having 1 to 4 carbon atoms, and

n is the integer 2 or 3.

B 469,468
METHOD FOR PRODUCING THERMOPLASTIC RESIN

Fusaji Shoji; Hisashi Kohgame, and Tadashi Muroi, all of Hitachi, Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Co., Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 269,762, July 7, 1972, abandoned. This application May 13, 1974, Ser. No. 469,468
Claims priority, application Japan, July 9, 1971, 46-50281
Int. Cl.² C08L 23/26; C08F 255/06, 255/10
U.S. Cl. 260—878 R **26 Claims**

References Cited
UNITED STATES PATENTS

3,538,190	11/1970	Meredith et al.	260/878 R
3,538,191	11/1970	Meredith et al.	260/878 R
3,538,192	11/1970	Bishop, Sr.	260/878 R
3,538,193	11/1970	Meredith	260/878 R
3,642,950	2/1972	O'Shea	260/878 R
3,676,528	7/1972	Severini et al.	260/878 R
3,819,765	6/1974	O'Shea	260/878 R

1. A method for producing a thermoplastic graft copolymer resin comprising preparing a solution by dissolving 5 to 45 parts by weight of (a) at least one substantially non-polar rubbery polymer selected from the group consisting of ethylene-propylenediene rubber, butyl rubber and mixtures thereof having an iodine value of 2 to 40, and 95 to 55 parts by weight of a vinyl monomer component including 2 to 98 percent by weight of (b) an aromatic vinyl monomer and 98 to 2 percent by weight of (c) an aliphatic vinyl monomer represented by the general formula $CH_2=C(R)X$, wherein R is hydrogen, a methyl or ethyl group, and X is —CN, —COOH —$COOCH_3$ or —$COOC_2H_5$, in an organic solvent capable of dissolving said non-polar rubbery polymer, the amount of solvent being 5 to 50 parts by weight per 100 parts by weight of the total of components (a), (b) and (c); suspending 100 parts by weight of said solution in 70 to 400 parts by weight of an aqueous medium for forming a suspension of said solution suitable for suspension polymerizing; and suspension-polymerizing in the presence of a polymerization initiator.

B 471,494

2-[(3-PHTHALIMIDOMETHYL)-5-METHYL-4H-1,2,4-TRIAZOL-4-YL]BENZOPHENONES

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 332,377, Feb. 14, 1973, abandoned. This application May 20, 1974, Ser. No. 471,494

Int. Cl.² C07D *403/06*

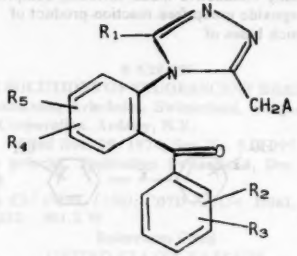
U.S. Cl. 260—308 R **3 Claims**

References Cited

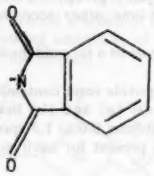
UNITED STATES PATENTS

3,842,089	10/1974	Hester et al.	260/308 R
3,856,792	12/1974	Hester	260/308 R

1. A compound of the formula:



wherein A is



wherein R_1 is selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms, inclusive, phenyl, benzyl, and wherein R_2, R_3, R_4, and R_5 are selected from the group consisting of hydrogen, alkyl as defined above, halogen, nitro, cyano, trifluoromethyl, and alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, and alkanoylamino in which the carbon moiety is between 1 to 3 carbon atoms, inclusive, and dialkylamino in which alkyl is defined as above.

B 478,759

METHOD OF MAKING A DRY-TYPE PET FOOD

Alexander Balaz, Barrington; David P. Bone, Palatine, and Edward L. Shannon, Barrington, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed June 12, 1974, Ser. No. 478,759

Int. Cl.³ A23J *3/00;* **A23K** *1/14*

U.S. Cl. 426—656 **37 Claims**

References Cited

UNITED STATES PATENTS

3,684,522	8/1972	Anker et al.	426/364 X
3,759,715	9/1973	Loepiktie et al.	426/364 X
3,814,823	6/1974	Yang et al.	426/362

1. A method for the production of a dry pet food product containing less than 15 percent by weight moisture having a soft elastic, substantially fibrous meat-like texture and appearance comprising the steps of:

A. blending a dough containing fat, a proteinaceous adhesive, a plasticizing agent with sufficient water to produce a product having less than 15 percent moisture and an additional amount of water sufficient for processing; wherein said proteinaceous adhesive is present in an amount of from about 4 to about 60 percent by weight; and said plasticizing agent is present in an amount of from about 2 to about 40 percent by weight;

B. cooking said dough at a temperture between 200° and 300°F.;

C. stretching the cooked mixture to form a fibrous-like mixture; and

D. immediately cooling the stretched mixture to prevent the fibers from watering.

B 485,169

METHOD AND APPARATUS FOR MOULDING TIRES EMPLOYING PIVOTING TREAD FORMING SEGMENTS

Arthur David Tippin, Tamworth, England, assignor to Dunlop Limited, Birmingham, England

Filed July 2, 1974, Ser. No. 485,169

Claims priority, application United Kingdom, July 12, 1973, 33223/73

Int. Cl.² B29H *5/02*

U.S. Cl. 264—315 **5 Claims**

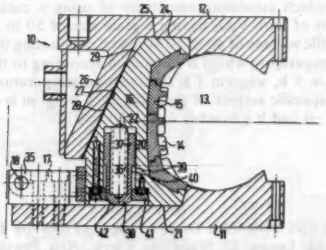
References Cited

UNITED STATES PATENTS

3,505,447	4/1970	Billes	264/326 X
3,704,082	11/1972	Hottle	425/46
3,730,658	5/1973	Marra	425/47
3,806,288	4/1974	Materick	425/47
3,817,670	6/1974	Leblond	425/47 X

FOREIGN PATENTS OR APPLICATIONS

1,160,606	1/1964	Germany	425/47
2,000,796	7/1971	Germany	425/46
1,168,716	10/1969	United Kingdom	
1,920,836	10/1963	Germany	



1. A method of moulding a tire which comprises locating on a first mould part a tire or tire carcass of bowed configuration in radial section such that the beads are wider apart than any other parts of the tire, inflating a diaphragm to enter the tire or carcass, moving a second mould part relative to the first part to close the mold and to deform the tire or carcass generally to C-shape in radial section and provide a circular mould cavity enclosing the tire or carcass, and simultaneously with closure of the mould, jointly angularly moving by means of the second mould part a plurality of segments adapted to form a tread on the tire or carcass whereby the segments pivot about respective pivot axes all lying in a plane to which the axis of the mould cavity is perpendicular and are therefore displaced by the second mould part both axially and inwardly of the mould cavity to final molding position, said axial displacement of said segments being generally coincident with axial displacement of the tread portion of the tire or carcass during said deformation thereof.

2. A tire mould comprising upper and lower mould parts, the upper mould part being arranged to be raised and lowered

to open and close the mould and in its closed position defining with the lower mould part a circular, tire forming cavity, a plurality of tread forming segments pivotable relative to the lower mould part about individual axes all lying in a plane perpendicular to the axis of the cavity of the closed mould between a final molding position in which the segments are arranged to engage the circumference of a tire or tire carcass inserted in the cavity and an inoperative position spaced radially outwardly of the cavity from the final molding position, each segment moving in an arcuate path about the respective axis thereof and therefore both radially and axially of the cavity, the upper mould part having a cam surface which co-operates with cam surfaces of the segments as the mould is closed whereby the segments are jointly displaced in said arcuate paths from their inoperative position to their final molding position by the upper mould part as the latter moves to the closed position.

B 494,339

PROCESS FOR THE PRODUCTION OF CYANOPYRIDINES

Francois Moulin, Neuchatel, and Karl-Josef Boosen, Erlach, both of Switzerland, assignors to Lonza, Ltd., Gampel, Switzerland

Filed Aug. 2, 1974, Ser. No. 494,339

Claims priority, application Switzerland, Aug. 10, 1973, 11550/73

Int. Cl.² C07D *213/57*

U.S. Cl. 260—294.9 **14 Claims**

References Cited

UNITED STATES PATENTS

2,839,535	6/1958	Hadley et al.	260/294.9
3,637,715	6/1972	Scheidt	260/294.9

1. In a process for the production of a cyanopyridine by conversion of a monoalkylpyridine, the alkyl having one to four carbon atoms, with (a) oxygen or air and (b) ammonia in the gaseous phase in the presence of a catalyst, the improvement which consisting essentially of using a catalyst which consists of pure V_2O_5 having a grain size of 50 to 500 μ and a specific surface of up to 10 m^2/g and conducting the reaction at a temperature which is calculated according to the formula $T = S.m + b$, wherein T is the reaction temperature in °C., S is the specific surface of the catalyst in m^2/g, m is a factor of −4 to −6 and b a number from 320 to 322.

B 499,324

PROCESS FOR THE DESULFURIZATION OF FLUE GAS

John M. Longo, 53 Woodbine Circle, New Providence, N.J. 07974

Filed Aug. 21, 1974, Ser. No. 499,324

Int. Cl.² C01B *7/00*; B01J *8/00*

U.S. Cl. 423—244 **7 Claims**

References Cited

FOREIGN PATENTS OR APPLICATIONS

1,154,008	6/1969	United Kingdom	423/244
903,612	8/1962	United Kingdom	423/244

OTHER PUBLICATIONS

Lowell et al., Selection of Metal Oxides for Removing SO_2 from Flue Gas, Ind. Eng. Chemical Process Design, Development, Vol. 10, No. 3, 1971.

1. A process for the removal of sulfur oxides from a gas, which comprises the steps of contacting the gas with a cerium oxide sorbent at a temperature of from 300° to 800°C until the cerium oxide sorbs sulfur oxide, and regenerating the spent sorbent by contacting with hydrogen wherein during regeneration the sulfur sorbed cerium is subsequently converted to cerium oxide and the desorbed sulfur specie is initially sulfur dioxide and subsequently hydrogen sulfide.

B 522,629

PAINT BINDERS OF MANNICH BASES AND EPOXY RESINS

Firtz Erdmann Kempter, Mannheim; Günther Sabelus, Lambsheim, and Herbert Spoor, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Nov. 11, 1974, Ser. No. 522,629

Int. Cl.² C08G *51/24*

U.S. Cl. 260—29.2 EP **3 Claims**

References Cited

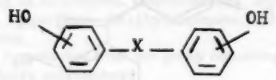
UNITED STATES PATENTS

3,436,373	4/1969	Cox et al.	260/51.5
3,790,606	2/1974	Sellet	260/401

1. An aqueous paint binder for the cathodic electrocoating of electrically conductive metal surfaces, comprising a substantially epoxide group-free reaction product of

a. Mannich bases of

a_1.



wherein X is a straight-chain or branched-chain divalent aliphatic radical of from 1 to 3 carbon atoms or is $>SO_2$, $>SO$ or $-O-$

a_2. at least one secondary mono amine containing at least one hydroxyalkyl group, or a mixture of said secondary amine with one other secondary or primary mono amine, and

a_3. formaldehyde or a formaldehyde-donating compound, with

b. at least one epoxide resin containing 1,2 epoxide groups, the components (a) and (b) being combined in such quantities that from 0.6 to 1.3 epoxide groups of component (b) are present for each molecule of component (a_1).

B 525,204

DEMULSIFICATION PROCESS

Norman N. Li, 16 Turner Ave., Edison, N.J. 08817; Taras Hucal, 99 Elizabeth Ave., Iselin, N.J. 08830, and Robert P. Cahn, 799 Ridgewood Road, Millburn, N.J. 07041

Filed Nov. 19, 1974, Ser. No. 525,204

Int. Cl.² B01D *13/00, 11/00*

U.S. Cl. 210—22 R **9 Claims**

References Cited

UNITED STATES PATENTS

3,436,342	4/1969	Fujiwara et al.	210/21

1. In a liquid membrane process for removing a dissolved component from an aqueous feedstream which comprises contacting said feedstream with a water-in-oil emulsion which is characterized as having an exterior phase which is permeable by said dissolved component, an interior phase containing a reagent which reacts with said permeable dissolved component and converts said permeable dissolved component into a non-permeable form, the improvement which comprises contacting said water-in-oil emulsion with said aqueous feedstream for a time and at conditions sufficient to convert a substantial portion of said reagent to the reaction product of said reagent and said dissolved component, separating said water-in-oil emulsion from said aqueous feedstream, demulsifying said water-in-oil emulsion by (1) mixing the emulsion, at a volume ratio of from 1/9 to 9/1, with a mixture of two or

more comiscible volatile solvents, at least one of which is an alcohol or a ketone that is miscible with the water and at least one of which is a low boiling hydrocarbon or chlorinated hydrocarbon which is miscible with the oil, the weight ratio of said alcohol or ketone and hydrocarbon being from 1/9 to 9/1 and the oil miscible solvent further characterized as having a boiling point of at least 50°C less than the boiling point of the oil, under conditions of agitation, (2) terminating said agitation and allowing the mixture to separate into an oil and water layer, said water layer comprising substantially all of said reaction product and said unreacted reagent and said oil layer comprising substantially all of the components of the exterior phase of said emulsion, separating said oil and water layers, distilling off said oil miscible solvent from said oil layer, and recycling said oil back to an emulsification zone for use in preparing fresh emulsion.

B 528,297

STABLE SOLUTIONS OF FLUORESCENT BRIGHTENERS

Frank Lohmann, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 29, 1974, Ser. No. 528,297

Claims priority, application Switzerland, Dec. 19, 1973, 17811/73

Int. Cl.² C09K *11/00;* **C07D** *231/54;* **D06L** *3/12*

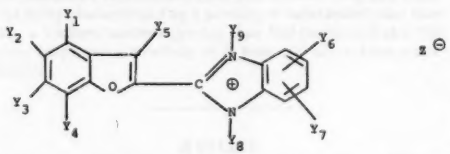
U.S. Cl. 252—301.2 W **11 Claims**

References Cited

UNITED STATES PATENTS

3,649,633	3/1972	Mingasson et al.	260/281
3,757,010	9/1973	Balzer et al.	260/240 B
3,776,905	12/1973	Zweidler et al.	260/240.1
3,849,331	11/1974	Mingasson et al.	252/301.2 W

1. A stable acid or neutral solution of quaternised fluorescent brighteners consisting essentially of a quaternised fluorescent brightener of the formula



wherein Y_1 represents hydrogen, methyl, ethyl, methoxy, halogen or together with Y_2 represents a fused benzene ring, Y_2 represents hydrogen, methyl, ethyl, methoxy, halogen or together with Y_1 or Y_3 represents a fused benzene ring, Y_3 represents hydrogen, methyl, ethyl, alkoxy with 1 to 4 carbon atoms, halogen or together with Y_2 or Y_4 represents a fused benzene ring, Y_4 represents hydrogen, alkyl with 1 to 4 carbon atoms, methoxy, halogen or together with Y_3 represents a fused benzene ring, Y_5 represents hydrogen, alkyl with 1 to 4 carbon atoms or phenyl which is unsubstituted or substituted by at least one of methyl or methoxy, Y_6 represents hydrogen, alkyl with 1 to 4 carbon atoms, alkylsulphonyl with 1 to 4 carbon atoms, methoxy or halogen, Y_7 represents hydrogen, methyl, methoxy or halogen, Y_8 represents alkyl with 1 to 4 carbon atoms, hydroxyalkyl with 2 to 4 carbon atoms, cyanoethyl, phenyl, cyclohexyl or benzyl which is unsubstituted or substituted by chlorine, methyl or methoxy, Y_9 represents alkyl with 1 to 4 carbon atoms which is unsubstituted or substituted by hydroxy or alkoxy with 1 to 4 carbon atoms, benzyl which is unsubstituted or substituted by chlorine or methoxy or represents a radical $-CH_2CN$, $-CH_2CONH_2$ or $-CH_2COOR$, wherein R represents an alkyl group with 1 to 4 carbon atoms, and Z represents halogen, an alkylsulphate with 1 to 4 carbon atoms or a phenylsulphonyl radical which is unsubstituted or substituted by methyl and, in the case of the weakly acid solution, a polar organic compound, water and a weak acid, and, in the case of the neutral solution, a polar, aprotic organic compound and water.

B 552,508

PROCESS FOR PREPARING 4-AMINO-2,2,6,6-TETRAMETHYL PIPERIDINE

Reinhard Lantzsch, and Dieter Arlt, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 24, 1975, Ser. No. 552,508

Claims priority, application Germany, Mar. 16, 1974, 2412750

Int. Cl.² C07D *211/58*

U.S. Cl. 260—293.52 **9 Claims**

References Cited

OTHER PUBLICATIONS

Paden et al., J. Am. Chem. Soc. 58, pp. 2487–2499 (1936).

1. Process for preparing 4-amino-2,2,6,6-tetramethyl piperidine which comprises reacting phorone with ammonia and hydrogen in the presence of a hydrogenation catalyst.

B 593,781

FIRECHECK

Wallace I. Stenzel, Thiensville; Frederick W. Krifrin, Janesville, and Donald J. Allen, Fort Atkinson, all of Wis., assignors to Waukee Engineering Co., Milwaukee, Wis.

Division of Ser. No. 409,401, Oct. 25, 1973. This application July 7, 1975, Ser. No. 593,781

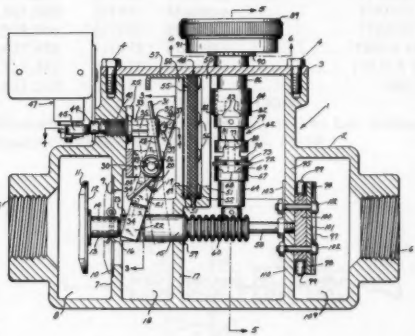
Int. Cl.² F23D *13/46*

U.S. Cl. 48—192 **9 Claims**

References Cited

UNITED STATES PATENTS

2,169,411	8/1939	Drane	137/584 X
2,332,380	10/1943	Hess	48/192
2,913,320	11/1959	Williams	48/192



1. A firecheck adapted to be connected in a combustible gas line, comprising a casing having an inlet and an outlet and an access opening, a cover plate to removably enclose the access opening, a burner screen located within the casing between the inlet and the outlet and disposed in communication with said access opening, control valve means disposed within the casing for controlling the flow of gas through the casing and movable between an open position and a closed position, opening means for moving the valve to the open position, valve closing means for moving the valve to the closed position, and means responsive to removal of the cover plate from the casing for actuating said valve closing means to move said valve means to the closed position.

B 485,188

PROCESS FOR BULK DYEING HIGH MOLECULAR ORGANIC COMPOUNDS

Arnold Wick, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 1, 1974, Ser. No. 485,188

Claims priority, application Switzerland, July 4, 1973, 9769/73

Int. Cl.² C08K 5/35

U.S. Cl. 260—40 P 6 Claims

References Cited

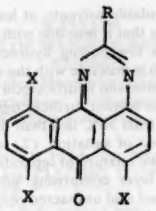
UNITED STATES PATENTS

3,730,955 5/1973 Jaffe ..... 260/256.4 Q

FOREIGN PATENTS OR APPLICATIONS

1,170,899 11/1969 United Kingdom ..... 260/256.4 Q

1. A process for bulk dyeing high molecular organic compounds characterized by employing anthrapyrimidines of the formula



as the dyestuffs wherein R is an aromatic radical, one X is an arylamino group, and the remaining X groups are hydrogen atoms.

B 059,512

MATERIAL FOR MAGNETIC TRANSDUCER HEADS

Jean Berchtold, La Jolla, Calif., assignor to Spin Physics, Inc., San Diego, Calif.

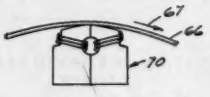
Filed July 30, 1970, Ser. No. 59,512
Int. Cl.[2] G11B 5/22, 5/14
U.S. Cl. 360—125 6 Claims

References Cited
UNITED STATES PATENTS

2,801,942	7/1957	Nachman	179/100.2 C
2,992,474	7/1961	Adams	179/100.2 C
3,262,763	7/1966	Bechtold	75/205
3,417,386	12/1968	Schneider	179/100.2 C
3,424,685	1/1969	Pierrot	252/62.56
3,469,942	9/1969	Henneberger et al.	252/62.56
3,472,655	10/1969	Fuchs et al.	75/205
3,557,266	1/1971	Chiba et al.	252/62.56

FOREIGN PATENTS OR APPLICATIONS

1,437,301	6/1965	France	75/205



1. A hot-pressed sintered magnetic material consisting essentially of an alloy having an aluminum content of 4 to 6.5% by weight and a silicon content from 8 to 11% by weight, with the remainder substantially iron, said sintered magnetic material being characterized by a porosity of substantially less than 1%, a Vickers hardness greater than 600 (measured at a 300 gram load) and a resistivity of at least 100 micro-Ohm-centimeters.

B 071,613

SYSTEM AND METHOD OF LIQUID SCINTILLATION COUNTING

Edward Rapkin, Short Hills, N.J., assignor to Intertechnique, S.A., Plaisir, France

Filed Sept. 11, 1970, Ser. No. 71,613
Int. Cl.[2] G01T 1/00
U.S. Cl. 250—328 37 Claims

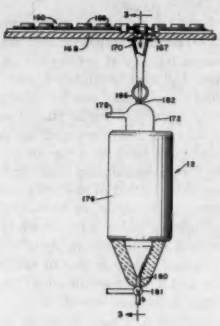
References Cited
UNITED STATES PATENTS

2,961,541	11/1960	Ruderman	250/71.5 R
3,188,468	6/1965	Packard	250/106 SC X
3,571,596	3/1971	Frank	250/106 SC
3,574,064	4/1971	Binnings	250/106 SC X
3,604,935	9/1971	Nather	250/328
3,728,084	4/1973	Hulsen	250/328 UX
3,797,999	3/1974	Witz et al.	250/361 C X

FOREIGN PATENTS OR APPLICATIONS

1,573,284	7/1969	France	250/106 T

1. A liquid scintillation counting system comprising (a) a combustion chamber for combusting radioactive samples; (b) conveying means for retaining a multiplicity of said radioactive samples in storage and for conveying said radioactive samples from said storage into said combustion chamber in sequence so that each sample enters said chamber when said chamber is ready for a new sample; (c) means for collecting from said combustion chamber combustion product resulting



from the combustion of each sample and retaining said product in a liquid scintillator

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B 347,661

VIDEO SIGNAL RECORDING AND REPRODUCING APPARATUS FOR STOP MOTION PICTURE

Akiyoshi Iyama, Sagamihara; Toshi Ito, Tokyo; Katsutoshi Tajima, and Hiroshi Ishibashi, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

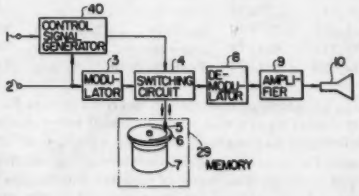
Filed Apr. 4, 1973, Ser. No. 347,661
Claims priority, application Japan, Apr. 7, 1972, 47-34380
Int. Cl.[3] H04N 5/78
U.S. Cl. 360—35 8 Claims

References Cited
UNITED STATES PATENTS

2,955,157	10/1960	Young	178/6.6 A
3,026,369	3/1962	Lohmann	178/6.6 A
3,397,283	8/1968	Stosberg	178/6.6 A
3,501,584	3/1970	Machein	178/6.6 A
3,518,366	6/1970	Phan	178/6.6 A
3,637,928	1/1972	Poulett	178/6.6 DD
3,732,362	5/1973	Kinjo	178/6.6 FS
3,812,522	5/1974	Izura	360/10

OTHER PUBLICATIONS

"Reviewing Slow-Motion Disc Principles," by Lee Stratton; Broadcast Engineering; Feb., 1969, pp. 14–18.



1. A recording and reproducing apparatus for recording and reproducing one field television signal selected from multiple television signals comprising:

a television signal source for generating said multiple television signals having vertical synchronizing signals;

a modulator whose input terminal is supplied with said multiple television signals generated from said television signal source for producing modulated multiple television signals suitable for recording;

a single magnetic disc which is rotated at a rate of one revolution per one field period for storing a modulated one field television signal selected from said modulated multiple television signals;

a single fixed head for recording said modulated one field television signal on said magnetic disc together with erasing an unnecessary signal previously recorded on said magnetic disc by said modulated one field television signal supplied to said head and for taking out said modulated one field television signal stored on said magnetic disc repeatedly upon completion of the recording of said modulated one field television signal;

a demodulator for demodulating said modulated one field television signal taken out of said magnetic disc to deliver a stop motion picture signal as its output;

means for producing a pulse train which is in synchronism with said vertical synchronizing signals and has a repetition frequency half as low as that of said vertical synchronizing signals and a pulse width equal to one field period of said multiple television signal;

means for producing a trigger pulse at any instant when desired;

means responsive to said trigger pulse for taking out of said pulse train as a control pulse a pulse following said trigger pulse;

first switching means connected between said modulator and said head, said first switching means being conductive state during a period when said control pulse is supplied thereto for transmitting said modulated one field television signal from said modulator to said head;

second switching means connected between said head and said demodulator, said second switching means being conductive state during a period when said control pulse is not supplied thereto for transmitting said modulated one field television signal taken out of said disc to said demodulator.

B 391,844

INTERRUPT INFORMATION INTERFACE SYSTEM

Yuzo Kita, and Kazuo Watanabe, both of Kokubunji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 27, 1973, Ser. No. 391,844
Int. Cl.² G06F *3/00*
U.S. Cl. 340—172.5 **8 Claims**

References Cited
UNITED STATES PATENTS

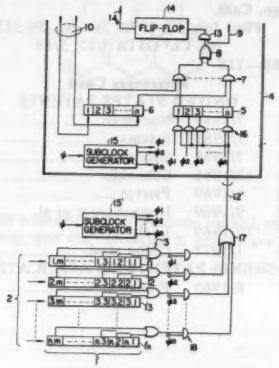
3,380,042	4/1968	Townsend et al.	340/172.5
3,395,394	7/1968	Cottrell, Jr.	340/172.5
3,599,162	4/1971	Byrns et al.	340/172.5
3,629,852	12/1971	Thexton	340/172.5
3,665,405	5/1972	Sanders	340/172.5
3,755,787	8/1973	Heneger	340/172.5
3,794,970	2/1974	Pearson et al.	340/172.5

1. In an interrupt information interface system for delivering interrupt signals to a computer, said computer including an interrupt receiving register having a prescribed bit storage capacity for receiving respective interrupt signals from a plurality of interrupt level memory registers, the number of which interrupt level memory registers is equal to the number of interrupt levels of said interrupt signals and corresponds to said prescribed bit storage capacity of said interrupt receiving register, the improvement comprising:

clock generator means for generating a series of clock pulses;

first gate means, coupled to said plurality of interrupt level memory registers and said clock generator means, for gating the contents of said interrupt level memory registers therefrom in accordance with said series of clock pulses over a single interface line to said computer; and

second gate means, coupled to said single interface line and said clock pulse generator means, for gating interrupt level signals, representative of the contents of said plurality of interrupt level memory registers, transmitted over



said signal interface line, to the respective bit storage positions of said interrupt receiving register.

B 442,295

RECIRCULATION OR STIRRED REACTOR FLOW LASER

Ian T. Osgerby, Nashville, Tenn., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 13, 1974, Ser. No. 442,295
Int. Cl.² H01S *3/22*
U.S. Cl. 331—94.5 G **6 Claims**

References Cited
UNITED STATES PATENTS

3,720,885	3/1973	Koloc	331/94.5 G
3,842,363	10/1974	Dobrzelcki et al.	331/94.5 G

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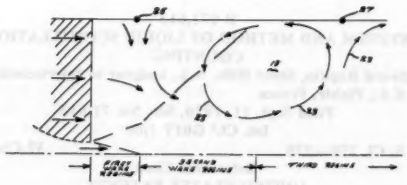


1. In a chemical reaction subsonic flow type laser for producing a uniform mixture of active laser gas molecules, the improvement comprising:

a combustor section for generating excited gas atoms therein and a flow of said atoms therefrom, a volume expansion chamber adjacent and downstream from said combustor section for expanding said gas atoms, means in the wall of said expansion chamber for adding a diluent to said excited gas atoms, a relatively small diameter sonic orifice adjacent and downstream of said expansion chamber, a reaction cavity, means for flowing said gas atoms through the sonic orifice to create a high velocity flow through said orifice into the reaction cavity, plenum means comprising a porous metallic structure about said sonic orifice for injecting a cold diluent at a low velocity into the gas flow in the reletively large flow area about the

sonic orifice for setting up a low momentum reletively large area flow of cold reactant gas about a relatively small area high momentum flow of excited gas atoms for setting up a strong recirculating flow of said excited atoms and cold gas downstream of the sonic orifice in said reactor cavity for creating a uniformly distributed mixture of active laser gas reactant molecules, the region of said recirculating flow lying between upstream and downstream stagnation points which lie within said reaction cavity.

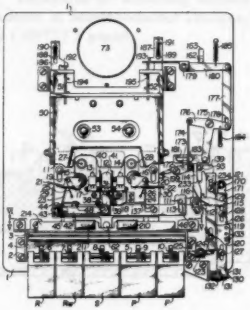
B 453,432
AUTOMATIC REVERSE TYPE CASSETTE TAPE RECORDER

Shichiro Fukatsu, Tokyo, Japan, assignor to Akai Electric Company, Limited, Tokyo, Japan

Filed Mar. 21, 1974, Ser. No. 453,432
Claims priority, application Japan, Mar. 21, 1973, 48-32427
Int. Cl.² G11B *15/04, 15/52*
U.S. Cl. 360—60 **5 Claims**

References Cited
UNITED STATES PATENTS

2,430,538	11/1947	Somers	360/63



1. A cassette type tape recorder enabling automatic and continuous recording or reproduction of the tape from one end of the tape to the other end thereof and from said other end thereof back to said one end thereof, comprising:

a chassis;

an electric motor mounted on said chassis for rotation in one direction;

a pair of capstans each being provided with a flywheel and arranged to be rotated by said motor respectively in opposite directions;

a pair of pressure rollers adapted to cooperate with said pair of capstans for transportation of the tape;

an actuating means arranged to alternately assume a first position where one of said pair of capstans cooperate with one of said pair of pressure rollers and a second position where the other of said capstans cooperates with the other of said pressure rollers;

means for detecting the tape end;

an operating means for operating said actuating means which includes a pin operable in a first position to operate said operating means and in a second position to bring the tape recorder into a stop condition;

first means for moving said pin into one of said first and said second positions thereof; and

second means movable movable to a first position when said pin is positioned in its second position by said first means, to a second position when said pin is positioned in its first position by said first means and to a third position when said pin is positioned outside its first and second positions, respectively for recording or reproducing on only one side of the cassette, for recording or reproducing one time only on each side of the cassette, and for recording or reproducing continuously for both sides of the cassette.

B 458,010
METHOD AND APPARATUS FOR MEASURING RELATIVE PHASE SHIFT BETWEEN TWO PULSE TRAINS

Sverre George Sem-Sandberg, Mariebergsvagen 21, S-136 68 Handen, Sweden

Filed Apr. 4, 1974, Ser. No. 458,010
Claims priority, application Sweden, Apr. 16, 1973, 7353647
Int. Cl.² G01R *25/00*
U.S. Cl. 324—83 D **6 Claims**

References Cited
UNITED STATES PATENTS

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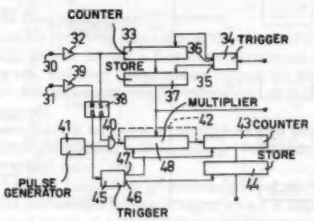
3,599,102	8/1971	Mous	324/83 D
3,745,544	7/1973	Ono	324/83 D
3,754,241	8/1973	Maehara	324/83 D



1. A method of measuring the relative phase shift between first and second repetitive electrical signals of the same frequency comprising

sensing predetermined level crossings on each of the two signals,

counting in a first counter the number of level crossings of the first signal over a fixed time interval to measure the frequency of that signal,

storing the value of the number from the first counter,

generating a pulse train of a fixed frequency equal in length to the time between the level crossing of the first signal and the level crossing of the second signal,

multiplying the frequency of the pulse train in a multiplier by a factor proportional to the value of the number stored from the first counter, and

counting the output pulses from the multiplier in a second counter to create a number proportional to the relative phase shift between the first and second signals.

B 476,568

VOICE KEYING SYSTEM FOR A VOICE CONTROLLED MUSICAL INSTRUMENT

Masahiko Tsunoo, Suita, and Kinji Kawamoto, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Co., Osaka, Japan

Filed June 4, 1974, Ser. No. 476,568
Int. Cl.[2] G10H 1/00, 5/02
U.S. Cl. 84—1.01 22 Claims

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3,767,833	10/1973	Noble et al.	84/1.01
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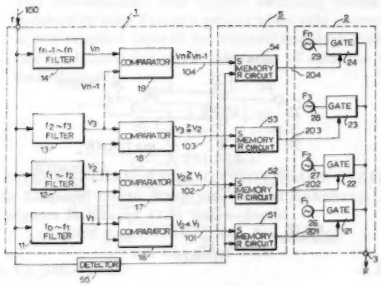

1. A voice keying system for a voice controlled musical instrument, comprising: a frequency responding means for responding to an input signal of audio frequency and generating a control signal which corresponds to each of a plurality of frequency bands of the input signal, said plurality of frequency bands corresponding to a plurality of notes of a musical scale, respectively, each of said frequency bands having a frequency range which covers approximately a tone interval of a half-tone of said musical scale, and a center frequency of each of said frequency bands being predetermined so as to correspond approximately to the frequency of each of said notes of the musical scale; a memory means coupled to said frequency responding means for storing the control signal; and a tone generator means coupled to the output of said frequency responding means for generating an output tone signal in response to said control signal, said output tone signal corresponding to the respective notes of the musical scale, whereby said output tone signal has less frequency errors and less frequency fluctuation than said input audio frequency signal within said frequency bands, respectively.

B 479,502

WELDING METHOD FOR DISSIMILAR METALS

Takamitsu Nakazaki, Takahagi; Hisanao Kita, Hitachi; Tatsuo Yonezawa, Hitachi, and Hisanori Okamura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed June 14, 1974, Ser. No. 479,502
Claims priority, application Japan, June 18, 1973, 48-67776
Int. Cl.[2] B23K 15/00
U.S. Cl. 219—121 EM 6 Claims

References Cited
UNITED STATES PATENTS

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3,560,700	7/1971	Reidelsturz et al.	219/121 EM
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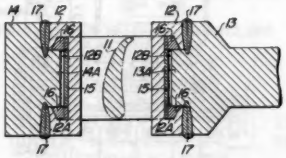
"Better, Less Costly Bi-Metal Turbine Wheels EB Welded" Reprinted from Welding Engineer, Aug. 1962.
"Electron Beam Welding of Bimetal Turbine Wheels" Engineering Report United Aircraft Corp., 1962.



1. A method for joining two dissimilar metal members comprising steps of

a. forming a joint surface on a first metal member,

b. preparing a metal plate with a recessed portion, a slot through said metal plate to said recessed portion, and a joint surface for abutting said joint surface of the first metal member, said metal plate being substantially of the same material as that of the first metal member,

c. fitting an end portion of a second metal member through said metal plate into said slot to extend into said recessed portion, said second metal member being of a material dissimilar from that of said first metal member and said metal plate,

d. welding a filler metal into said recessed portion to rigidly join said end portion of said second metal member to said metal plate,

e. abutting the joint surface of said first metal member to the joint surface of said metal plate, and

f. applying electron beam welding only along the interface formed between the abutting joint surfaces of said first metal member and said metal plate, thereby joining the first and second metal members to each other through the metal plate.

B 480,292

HIGH WITHSTAND VOLTAGE-SEMICONDUCTOR DEVICE WITH SHALLOW GROOVES BETWEEN SEMICONDUCTOR REGION AND FIELD LIMITING RINGS

Yutaka Misawa; Tatsuya Kamei, and Takahiro Nagano, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed June 17, 1974, Ser. No. 480,292
Claims priority, application Japan, Sept. 3, 1973, 48-98295
Int. Cl.² B43K *21/02, 21/04;* H01L *29/90, 29/72*
U.S. Cl. 357—55 **13 Claims**

References Cited
UNITED STATES PATENTS

3,241,010	3/1966	Eddleston	357/52
3,335,296	8/1967	Smart	357/52
3,391,287	7/1968	Kao et al.	357/52
3,489,622	1/1970	Barson et al.	357/34
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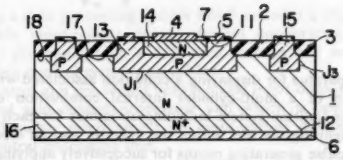

1. A high breakdown voltage semiconductor device comprising:

a semiconductor substrate of a first conductivity type having first and second principal surfaces located on opposite sides of said substrate, said substrate having a first depression extending from said first principal surface to a first prescribed depth into said substrate and surrounding a first surface portion of said first principal surface;

a first semiconductor region of a second conductivity type, opposite said first conductivity type, formed in said first surface portion of said first principal surface, extending into said substrate to a second prescribed depth greater than said first prescribed depth, and defining, with said substrate, a first PN junction which terminates in said depression;

means for increasing the breakdown voltage of said first PN junction comprising a second semiconductor region of said second conductivity type formed in a second surface portion of said first principal surface, extending to a third prescribed depth greater than said first prescribed depth, surrounding said depression, and defining with said substrate a second PN junction, one end of which terminates in said depression and is spaced apart from said first PN junction within a range over which a depletion layer can spread from said first PN junction in said substrate when said first PN junction breaks down; and

insulator material disposed on the surface of said depression.

B 484,121

RECURSIVE DIGITAL FILTER

Theodoor Antonius Carel Maria Claasen; Wolfgang Friedrich Georg Mecklenbrauker, and Johannes Bernhard Heinrich Peek, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 28, 1974, Ser. No. 484,121
Claims priority, application Netherlands, July 9, 1973, 7309534; Sept. 20, 1973, 7312946
Int. Cl.² G06F *15/20*
U.S. Cl. 235—152 **11 Claims**

References Cited
UNITED STATES PATENTS

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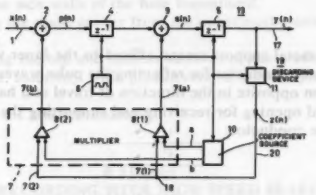
Parker, S. R. et al., *Limit-Cycle Oscillations in Dital Filters", In IEEE Trans. Circuit Theory CT-18(6):pp. 687–697, Nov. 1971.*



1. A digital filter comprising

input means for receiving input digital signals to be filtered: arithmetic means, having a first input connected to said input means, a second input, and an output, for performing a predetermined arithmetic operation on said input digital signals.

delay means, having an input connected to said output of said arithmetic means, and an output for producing a predetermined delay; and

feedback means, connected to said output of said delay means for providing a feedback signal which is applied to said second input of said arithmetic means; comprising discarding means for discarding a predetermined number of less significant bits.

B 493,370

PRECISE COAXIAL ATTENUATOR FOR PICOSECOND PULSES

Brian John Elliott, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 31, 1974, Ser. No. 493,370
Int. Cl.² H01P *1/22*
U.S. Cl. 333—81 A **2 Claims**

References Cited
UNITED STATES PATENTS

2,720,631	10/1955	Hall	333/97 R
3,668,416	6/1972	Marilleau	333/20 X
3,723,912	3/1973	Thatch	333/20
3,778,732	12/1973	Wang	328/65 X

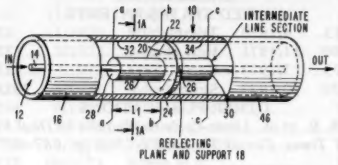
1. A device for attenuating short pulse waveforms in the picosecond domain comprising:

a. concentric coaxial transmission means, said coaxial transmission means comprising:

b. an outer conductor and an inner conductor having equal lengths;

c. a thin-walled intermediate conductor concentric with the inner conductor and substantially parallel with the outer conductor, said intermediate conductor having a first end

forming a first transitional plane with the outer conductor and a second end forming a second transitional plane with said outer conductor, said transitional planes dividing the outer conductor into a plurality of transmission means and attenuating the pulse wave with minimum distortion to the wavefront; and

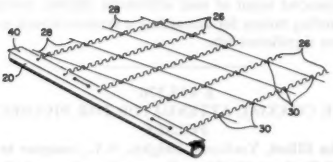


d. a metal support means affixed to the inner walls of the outer conductor for reflecting the pulse waves in a direction opposite to the direction of travel and having a central opening for receiving and supporting the intermediate conductor.

B 494,691
VARIABLE PROPERTY WIRE MESH ANTENNA STRUCTURE

David W. Moore, Manhattan Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Aug. 5, 1974, Ser. No. 494,691
Int. Cl.² H01Q 15/20
U.S. Cl. 343—840 **3 Claims**



1. A wire mesh structure comprising:
a supporting frame having spaced supporting members;
a wire mesh panel spanning the space between said supporting members including first wires extending between and secured to said supporting members and second wires disposed in crossing relation and secured to said first wires;
said first wires having a generally spring-like configuration which renders the latter wires resiliently compliant in their endwise directions, and said compliant wires being stressed in tension; and
said panel having two sections whose wire mesh areas have differing spring rates in the endwise directions of their respective compliant wires.

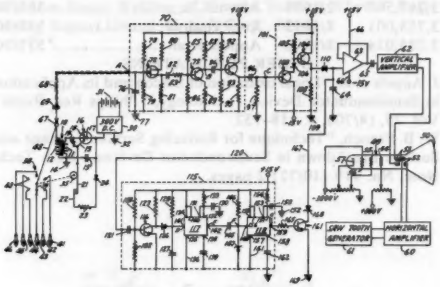
B 495,331
ENGINE DIAGNOSTIC APPARATUS

Eugene Dale Johnston, Roseville; Sydney J. Roth, Edina, both of Minn., and Joseph A. Marino, Waukesha, Wis., assignors to Applied Power Inc., Milwaukee, Wis.

Filed Aug. 7, 1974, Ser. No. 495,331
Int. Cl.² G01R 13/42, 23/00
U.S. Cl. 324—15 **4 Claims**

References Cited
UNITED STATES PATENTS

3,573,608	4/1971	Marino et al.	324/16 S
3,576,462	4/1971	Wanninger	324/16 S
3,650,149	3/1972	Howes	324/16 S
3,777,559	12/1973	Rennick et al.	324/16 S



1. Apparatus for displaying a condition associated with the operation of a multi-cylinder internal combustion engine having an ignition system including an igniter for each cylinder for igniting the fuel within the cylinder and an electrical voltage pulse generating means for successively applying voltage pulses very short in duration to each of said igniters to cause energization thereof, said apparatus comprising:
a cathode ray tube having a display screen,
means for producing a horizontal trace on said screen,
vertical deflection means for variably displacing said horizontal trace in a vertical direction by an amount and for a length of time dependent upon the magnitude and duration of a deflection signal applied to said means,
means including an energy storing means adapted to be connected to said voltage pulse generating means for storing energy in said storing means in an amount dependent upon the magnitude of the voltages across said igniters applied by said generating means,
means connecting said energy storing means to said vertical deflection means for causing said horizontal trace to be deflected by an amount dependent upon the magnitude of the voltages across said igniters as long as said capacitor remains charged,
first timing means connected to said energy storage means and to said igniters for successively deenergizing said energy storing means a short first predetermined period of time after the voltage pulse is first applied to each of said igniters so that the vertical deflection of said trace is terminated after the end of said first predetermined period of time, and
second timing means for maintaining said energy storage means deenergized for a second predetermined period of time which is very large compared with said first period of time but less than the time between successive voltage pulses of said voltage pulse generating means even when the engine is being operated at its normal upper limit of speed.

B 503,780

CONTROL SYSTEM FOR MAGNETIC DISC STORAGE DEVICE

Edward E. Henderson, Philadelphia; Akira Fujimoto, Conshohocken, and Stanley E. Gaw, Roslyn, all of Pa., assignors to Sperry Rand Corporation, Blue Bell, Pa.

Filed Sept. 6, 1974, Ser. No. 503,780
Int. Cl.² G06F *3/00*
U.S. Cl. 340—172.5 **34 Claims**

References Cited
UNITED STATES PATENTS

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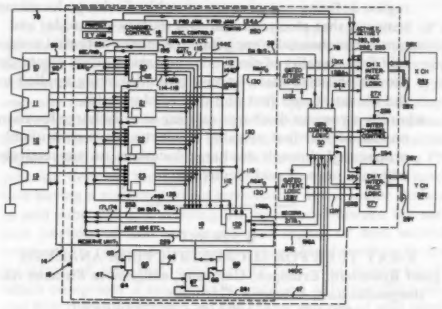
3,629,860	12/1971	Capozzi	340/172.5



1. In a data processing system which includes a plurality of rotatable input-output storage devices cooperating with a central processing unit, a data area locating and automatic queueing control system comprising:

a control unit connected between said input-output devices and said central processing unit which is operable to selectably interconnect an input-output device to the central processing unit,

a unit logic controller in said control unit for each input-output device,

priority control means in each said unit logic controller comprising a priority register,

each said priority register being activated by bits of a priority byte which identifies a predetermined assigned priority when the central processing unit seeks said data area,

and gating circuit means in said control unit for queueing access to said data area in different input-output devices on the plurality of the assigned priority stored in said priority register.

B 509,772

MULTILAYER CERAMIC SUBSTRATE STRUCTURE

Octavio I. Chirino; Joseph Hromek, both of Endwell; Kailash C. Joshi, Endicott, and George C. Phillips, Jr., Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 27, 1974, Ser. No. 509,772
Int. Cl.² H05K *1/04, 1/14*
U.S. Cl. 174—68.5 **9 Claims**

References Cited
UNITED STATES PATENTS

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3,699,919	10/1972	Coffman	118/56
3,770,529	11/1973	Anderson	174/68.5 X
3,852,877	12/1974	Ahn	27/625

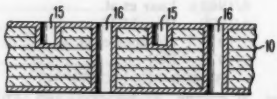
1. A monolithic multilayer ceramic substrate electrical interconnection system with interlayer electrical connecting by means of through holes and fabricated by:

drilling a plurality of green sheet lamina in accordance with a predetermined hole pattern,

stacking a holed green sheet laminae with binder rich sides up to form a laminar assembly,

stacking the uppermost green sheet lamina with a polyethylene-terephthalate carrier attached and adapted to function as a mask,

attaching the laminar stack to a rotatable wheel,



filling the hole formations formed by the laminar stacking with a metal paste composition including **70** to **90%** molybdenum powder,

rotating the wheel to remove excess metal paste and evenly coat the side walls of the hole formations,

removing the mask carrier from the uppermost green sheet lamina,

metallizing the top and bottom surfaces of the green sheet laminar assembly with predetermined circuit patterns, and

sintering the laminar assembly.

B 516,069

DATA RECORDING WITH HIGH SPEED SEARCH CAPABILITY

John R. Sykes, Rochester, N.Y., assignor to Sykes Datatronics Inc., Rochester, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,069
Int. Cl.² G11B *5/09*
U.S. Cl. 360—49 **17 Claims**

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UNITED STATES PATENTS

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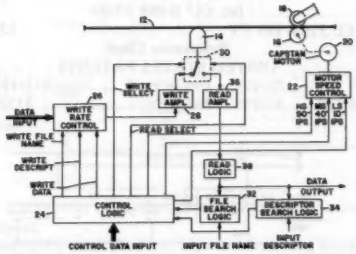
3,727,203	4/1973	Crossman	360/72
3,863,265	1/1975	Klumpp	360/72



1. For use in apparatus for writing and reading data signals on a tape record medium, a system for providing different access times for different items of data, said system comprising means for writing data signals representing each of said different items at different successively higher densities on said medium, and means for reading said data signals from said tape when said tape is travelling at different successively lower speeds, each corresponding to a different one of said densities whereby to provide access to items of data written at the lowest of said densities in the shortest time.

B 517,762
INSULATING NITRIDE COMPOUNDS AS ELECTRON EMITTERS

Jacques Isaac Pankove, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

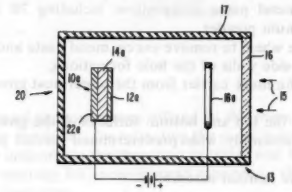
Filed Oct. 24, 1974, Ser. No. 517,762
Int. Cl.² H01J *39/06, 1/30, 19/24*
U.S. Cl. 313—94 **3 Claims**

References Cited
UNITED STATES PATENTS

3,387,161	6/1968	Laar et al.	313/94
3,513,316	5/1970	Hirschfeld	313/94 X
3,631,303	12/1971	Antypas et al.	313/94 X
3,644,770	2/1972	Bell	313/94

OTHER PUBLICATIONS

Maruska et al., "The Preparation and Properties of Vapor–Deposited Single–Crystalline GaN;" Applied Physics Letters, Vol. 15, No. 10, Nov. 15, 1969.



1. An electron emitter comprising:
a body of an electrically insulating nitride selected from a group consisting of GaN, AlN, InN, and mixtures thereof, said body being rendered electrically insulating by doping with a material selected from a group consisting of Be, Zn, Mg, and Li to a concentration greater than about $10^{18}/cm^3$; and
a layer of work function reducing material, on at least one surface of said body.

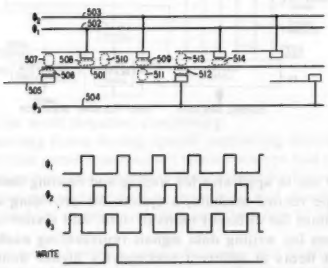
B 520,613
PLASMA DISCHARGE SHIFT REGISTERS

Peter Dinh-Tuan Ngo, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 4, 1974, Ser. No. 520,613
Int. Cl.² H05B *37/00*
U.S. Cl. 315—169 TV **13 Claims**

References Cited
UNITED STATES PATENTS

3,839,713	10/1974	Urade et al.	315/169 TV X
3,878,430	4/1975	Hirose	315/169 TV



1. Apparatus for propagating a gaseous discharge comprising
a substantially planar substrate,
a unitary conducting electrode positioned on said substrate,
a first ordered plurality of conducting electrodes positioned on said substrate adjacent said unitary path,
means selectively interconnecting said first plurality of electrodes to form N ≥ 3 sets of electrodes, all electrodes in each set being electrically interconnected, and all electrodes in any one set being electrically insulated from any electrode in any other set, electrodes in each of said sets being positioned in a repetitive ordered pattern with respect to electrodes in each of other sets, with each of said patterns including one and only one electrode from the ith of said sets, i=1, 2, ..., N and with said one electrode from the jth of said sets being positioned intermediate an electrode from the (j-1)th of said sets and an electrode from the (j+1)th of said sets, j=2, 3,..., N-1,
each of said first plurality of electrodes having a first region defining a stable discharge location between that electrode and said unitary electrode and at least a second region defining one or more unstable discharge locations between that electrode and said unitary electrode, and
means for sequentially applying an N-phase potential across said first plurality of electrodes and said unitary electrode the ith phase of said N-phase potential being applied to the ith set of said first plurality of electrodes
whereby a gaseous discharge existing at a discharge location on one of said first plurality of electrodes is controllably propagated through discharge locations on successively adjacent ones of said electrodes

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B 520,884
X-RAY TUBE FOR MICROSTRUCTURE ANALYSIS

Josef Rohmfeld, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

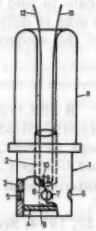
Filed Nov. 4, 1974, Ser. No. 520,884
Claims priority, application Germany, Nov. 19, 1973, 2357687
Int. Cl.² H01J *35/08*
U.S. Cl. 313—330 **3 Claims**

References Cited
UNITED STATES PATENTS

1,132,442	3/1915	Clawson	313/330 X
2,090,636	8/1937	Olshevsky	313/330 X
2,250,322	7/1941	Atlee	313/330 X

FOREIGN PATENTS OR APPLICATIONS

1,063,386	9/1963	United Kingdom	313/330



1. An anode for an X-ray tube for microstructure analysis utilized in the production of monochromatically-employable copper-X-radiation, comprising a copper anode, said copper anode having the copper of at least the portion of said anode located at the focal point of the X-rays alloyed with silver in amount of about $5 \cdot 10^{-3}$ to $5 \cdot 10^{-1}$ of silver in percent by weight.

B 535,209

SEMICONDUCTOR DEVICE

Yasuya Kajiwara; Seiichi Nagai, and Hiroyasu Hagino, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 23, 1974, Ser. No. 535,209
Claims priority, application Japan, Dec. 26, 1973, 49-2156
Int. Cl.² H01L 29/04
U.S. Cl. 357—59 5 Claims

References Cited
UNITED STATES PATENTS
3,602,782 8/1971 Klein 357/52
FOREIGN PATENTS OR APPLICATIONS
1,947,067 4/1970 Germany 357/59
OTHER PUBLICATIONS
Shepard, "Preventing Surface Inversion...", *IBM Tech. Discl. Bull.*, Vol. 16, No. 3, Aug. 1973, pp. 702–703.

1. In a semiconductor device of the type comprised of a semiconductor substrate having a first conductivity type and having a major surface; and a semiconductor region disposed within said substrate and having a second conductivity type opposite that of said first conductivity type, said semiconductor region having a surface portion terminating at and exposed at the major surface of said substrate and said semiconductor region jointly forming with said semiconductor substrate a PN junction defining the boundary therebetween, said PN junction having a surface portion terminating at the major surface of said substrate and defining the boundary between the surface portion of said semiconductor region of said second conductivity type and the major surface of said semiconductor substrate of said first conductivity type; the improvement which comprises: a substantially undoped polycrystalline silicon film disposed directly on the major surface of said semiconductor substrate and extending laterally thereon to overlie the major surface of said semiconductor substrate and to overlie the surface portion of said PN junction.

B 536,082

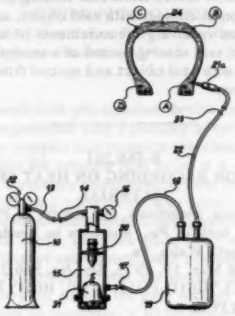
METHOD FOR TESTING THE ADHESION BETWEEN THE RUBBER COMPOUND AND THE CORD FABRIC OF A PNEUMATIC TYRE

Jean-Louis Boutaine, 4, square Debussy, 78150 Le Chesnay; Guy Courtois, 15, rue de l'Odeon, 75006 Paris, and Jean-Claude Tanguy, 16, boulevard de provence, 91200 Athis-Mons, all of France

Filed Dec. 24, 1974, Ser. No. 536,082
Claims priority, application France, Dec. 27, 1973, 73.46597
Int. Cl.² G01T 1/161
U.S. Cl. 250—303 9 Claims

References Cited
UNITED STATES PATENTS
3,247,382 4/1966 Schneider 250/303
3,742,988 7/1933 Kush 250/303

1. A method for determining whether a used tyre exhibits zones of detachment between the rubber compound and the cord fabric or zones of substantial porosity, wherein a gamma-ray emitting radioactive gas is injected under pressure into the body of the tyre in the zone of the layers of textile fibers which constitute the cord fabric, said gas is allowed to diffuse within the interior of the tyre and to accumulate at the defective



points, and the radiation emitted at least at one point of the tyre is detected.

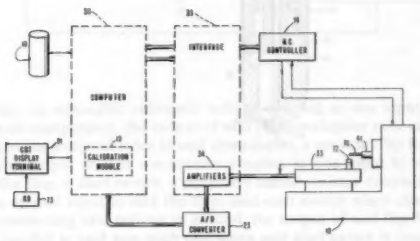
B 540,767

AUTOMATIC TOOL DEFLECTION CALIBRATION SYSTEM

Larry Gene Lankford, Mahopac, and William Robert Whittle, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 390,990, Aug. 23, 1973. This application Jan. 14, 1975, Ser. No. 540,767
Int. Cl.² G06F 15/46
U.S. Cl. 235—151.11 28 Claims

References Cited
UNITED STATES PATENTS
3,220,315 11/1965 Mathias ..... 408/11 X
3,573,588 4/1971 Geyer et al. 318/571
3,602,090 8/1971 Whetham ..... 235/151.11 UX
3,675,517 7/1972 Tadayoshi ..... 408/11 X
3,720,120 3/1973 Cutler ..... 318/571 X



1. In a computer controlled numerical-control system, an object,
a numerically-controlled machine tool indluding force sensing means for sensing deflection forces,
control means for controlling said numerically-controlled machine tool,
data means for generating data directing said tool towards contact with said object having an output coupled to the input of said control means,
incrementing means for incrementing said tool towards said object subsequent to contact,
said incrementing means having an output coupled to the input of said control means,
register means for recording amounts of displacement,
calculating means for calculating the deflection force as a function of tool displacement including an input con-

nected to said force sensing means and said register means, said calculating means receiving measurements of said deflection forces from said sensing means at a first tool position in contact with said object, and said calculating means receiving measurements of said deflection forces from said sensing means at a second tool position in contact with said object and spaced from said second tool position.

B 560,261

STYLUS FOR RECORDING ON HEAT SENSITIVE MATERIAL

Curtis R. Johnson, Flourtown, and Albert E. Paschkis, Gwynedd Valley, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Mar. 19, 1975, Ser. No. 560,261

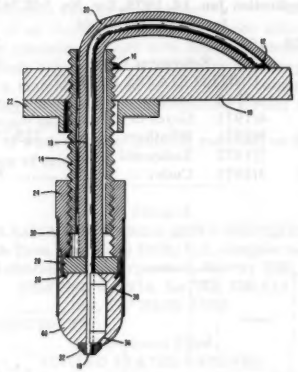
Int. Cl.² G01D 15/16, 15/10; H01C 7/02

U.S. Cl. 346—139 C **10 Claims**

References Cited

UNITED STATES PATENTS

3,402,378	9/1968	Catlin et al.	338/28
3,699,588	10/1972	Warrington et al.	346/139 C
3,735,417	5/1973	Holzhauser	346/139 C



1. A recording stylus assembly for recording on heat sensitive material, comprising

a solid mandrel of material having good heat conductivity,

a tip member of material providing good wear resistance, a low friction coefficient with said material and low heat conductivity, said member having an aperture for receiving the writing end of said mandrel so that it will contact the surface of said material when the tip member rides on the material during recording thereon, and

a thermistor having a positive temperature coefficient, said thermistor being assembled in position to intimately contact said mandrel over a portion of the surface of the thermistor for efficient heat transfer to the mandrel when electrical current is passed through said thermistor.

B 560,488

BINARY INCREMENTER CIRCUIT

Toshimasa Kihara, Kunitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 20, 1975, Ser. No. 560,488

Claims priority, application Japan, Mar. 27, 1974, 49-33566

Int. Cl.² G06F 7/50

U.S. Cl. 235—175 **11 Claims**

References Cited

UNITED STATES PATENTS

3,505,511	4/1970	Campano et al.	235/175
3,603,774	9/1971	DeVarda et al.	235/168
3,675,000	7/1972	Lincoln et al.	235/168
3,704,361	11/1972	Patterson et al.	235/92 CP

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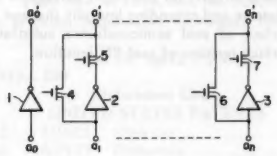
W. N. Carroll "High-Speed Counter Requiring No Carry Propagation" *IBM Journal* Oct. 1960 pp. 423–425.

J. W. Dieffendeufer "No Ripple Counter with Latch Implementation" *IBM Tech. Disclosure Bulletin* Aug. 1967, pp. 241–245.

J. E. Elliott "Increment–Decrement Logic" *IBM Tech. Disclosure Bulletin* Aug. 1968 pp. 297–298.



1. An incrementer circuit comprising:

a plurality of *n*-input terminals for receiving signals representative of *n* binary digits;

a plurality of *n*-output terminals for supplying signals representative of the addition of a "1" to said *n* binary digits; and

a plurality of coupling circuits, connected between said input terminals and said output terminals, for effecting the addition of a "1" to said *n* binary digits and coupling signals representative of the incremented number to said plurality of output terminals, wherein

the coupling circuit for the lowest digit comprises an inverter circuit connected between the input and output terminals for said lowest digit, and

the coupling circuit for each of the second-lowest to *n*th digit comprises

an inverter circuit coupled between the input and output terminals for that particular digit, and

a transfer gate circuit, responsive to the signals representative of the digits lower than that particular digit, for connecting the input terminal for that particular digit to the output terminal for that particular digit through one of a direct non-inverted connection and invertedly through said inverter circuit.

B 561,770

ADAPTIVE GRAY SCALE CONTROL CIRCUIT FOR TELEVISION VIDEO SIGNALS

Edwin B. Sirrine, South Wichita, Kans., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 25, 1975, Ser. No. 561,770
Int. Cl.[2] H04N 5/197, 5/58
U.S. Cl. 178—7.3 DC 1 Claim

References Cited
UNITED STATES PATENTS

3,670,100	6/1972	Briggs et al.	178/7.1
3,790,706	2/1974	Gubala et al.	178/7.1
3,783,300	1/1974	Johnson	250/564
3,800,161	3/1974	Scott et al.	250/564

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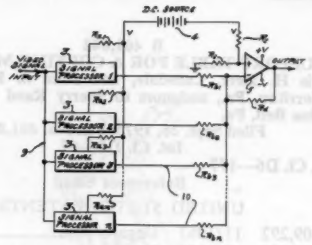
Automatic Gain Control For P.M. Tubes, Brecke et al., IBM Technical Disclosure Bulletin, Vol. 17, No. 7, Dec. 1974, pp. 2077–2078.



1. An adaptive gray scale control circuit for television video signals comprising

a multiplicity of signal processors, each signal processor including

a comparator having first and second inputs and an output,

an amplifier having an input and an output,

a capacitor connected between the input and output of said amplifier, and

resistance means, the output of said comparator being connected to the input of said amplifier through said resistance means and the output of said amplifier being connected to said second comparator input,

means for simultaneously applying a video signal to the first comparator input of each signal processor,

means for providing a discrete DC bias to the amplifier input of each signal processor,

an output summing amplifier having an input and an output, and

a circuit connecting the comparator output of each signal processor to the input of said output summing amplifier, said circuit including means for weighting the value of each comparator output signal.

B 566,572

PHOTOMULTIPLIER TUBE GAIN REGULATING SYSTEM

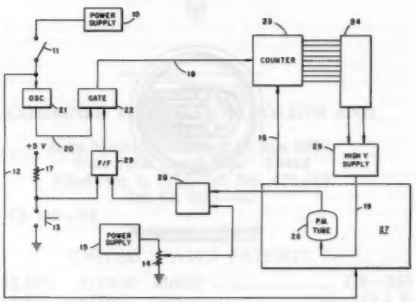
Wayne F. Johnson, Rte. 3, Box 140A, Loudon, Tenn. 37774

Filed Apr. 8, 1975, Ser. No. 566,572
Int. Cl.[2] G01N 21/24
U.S. Cl. 250—564 4 Claims

References Cited
UNITED STATES PATENTS

3,515,878	6/1970	Ried, Jr. et al.	250/207
3,555,284	1/1971	Anderson	250/565

1. In an analytical photometer device including a multicuvette rotor provided with a plurality of cuvettes for receiving respective samples and reagents thereinto for mixing and reacting, means for rotating said rotor at a desired selected high speed, a stationary photometer system for scanning all of said cuvettes during rotation of said rotor, and a read-out device connected to the output of said photometer system for evaluating the signal received from each of said cuvettes during operation of said system, said photometer system including a photomultiplier tube, the improvement comprising control circuitry for setting the gain on said photomultiplier tube comprising an oscillator, a 10 bit binary counter, a gate connected between said oscillator and said counter, a digital-to-analog converter coupled to the output of said counter, a DC-DC high voltage supply coupled to the output of said converter, said converter providing a DC output to said high voltage supply in direct proportion to the size of the input from said counter, the output of said high voltage supply coupled to the input of said photomultiplier tube, a comparator, an adjustable reference voltage coupled as one input to said comparator, the output of said photomultiplier tube coupled as a second input to said comparator, a set-reset flip-flop, the output of said comparator coupled as one input to said flip-flop, a start switch, a positively biased resistor coupled as a second input to said flip-flop, said start switch when closed connecting said resistor to ground, the output of said flip-flop coupled to said gate such that when said start switch is closed said flip-flop effects the closing of said gate to permit impulses from said oscillator to pass to said binary counter, whereby when the output voltage from said photomultiplier tube is equal to or greater than said reference voltage as sensed by said comparator then said comparator provides a signal to said flip-flop for effecting an opening of said gate such that the impulses stored in said counter will then provide a constant gain to said photomultiplier tube for a complete analytical run of said analyzer.



DESIGN APPLICATIONS

PUBLISHED MARCH 16, 1976
UNDER THE SECOND TRIAL VOLUNTARY PROTEST PROGRAM

NOTE.—A copy of the notice setting forth the details of the Second Trial Voluntary Protest Program may be found in the Patent and Trademark Notices section of this issue.

Any protests relating to the patentability of these published design applications must be filed in writing before June 16, 1976. These applications are available for inspection in the Allowed Files Branch, Crystal Plaza, Room 2-10C28. All correspondence should be addressed to:

Commissioner of Patents and Trademarks
Box TVPP
Washington, D.C. 20231

Printed copies of the published design applications may be purchased from the Patent and Trademark Office at 20 cents each. An "Index of Design Applicants and Assignees of Design Applications" and a concordance entitled "Classification of Published Design Patent Applications" are located in the back of this issue.

B 387,337
END CLOSURE FOR A CONTAINER
Arthur P. Zundel, Chicago, Ill., assignor to National Can Corporation, Chicago, Ill.
Filed Aug. 10, 1973, Ser. No. 387,337
Int. Cl. D9—*07*
U.S. Cl. D9—255

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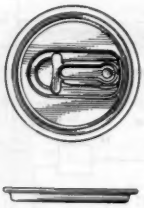
3,281,024	10/1966	Henchert et al.	D9—255
3,738,526	12/1973	Zundel et al.	D9—255



B 401,042
SUPPORT TABLE FOR A COPYING MACHINE
Lewis H. Herr, Lansdale, and John S. Kovacs, East Norriton, Pa., assignors to Sperry Rand Corporation, Blue Bell, Pa.
Filed Sept. 26, 1973, Ser. No. 401,042
Int. Cl. D6—*03*
U.S. Cl. D6—177

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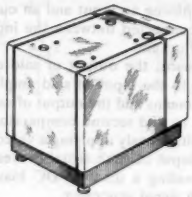
D. 218,855	9/1970	Noyes	D61—1 Q
D. 229,699	12/1973	Hehs	D6—167 X
D. 232,482	8/1974	Vigna	D61—1 Q



B 406,546
STRINGED INSTRUMENT HOLDER
Barbara D. Macmillan, 350 Starlight Crest Drive, La Canada, Calif. 91011
Filed Oct. 15, 1973, Ser. No. 406,546
Int. Cl. D6—*99*
U.S. Cl. D6—114

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D. 157,925	3/1950	Todd	D6—125
D. 207,453	4/1967	Hoffmann	D6—114
D. 215,311	9/1969	Born	D6—125 X
D. 227,522	7/1973	Burt	D6—117 X
D. 231,167	4/1974	Stap	D6—114
D. 217,225	4/1970	Fitzsimmons	D8—233

B 434,441
THREE WHEEL AUTOMOBILE
Paul Robert Gilbert, Thousand Oaks, Calif., assignor to Gilbert Transalectric Corp., Los Angeles, Calif.
Filed Jan. 18, 1974, Ser. No. 434,441
Int. Cl. D12—*08*
U.S. Cl. D12—85

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D. 200,703	3/1965	Thomas et al.	D12—85

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1,354,620	1/1964	France	296—28 R

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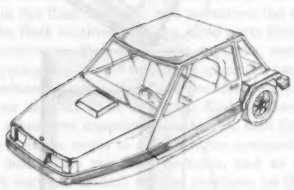
Austro Motor, July 1970, p. 300, Bond "Bug," bottom left side of page.

Washington Post, Apr. 10, 1973, p. C1, Pedicar, top of page.



B 442,163
COMBINED STOOL AND TRAY UNIT
Bobby J. Robinson, 129 Meadow Drive, Converse, Tex. 78109
Filed Feb. 13, 1974, Ser. No. 442,163
Int. Cl. D6—*01*
U.S. Cl. D6—40

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D. 151,983	12/1948	Guerten	D6—36
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D. 184,081	12/1958	Belz	D6—36
D. 219,734	1/1971	Winrow	D6—42

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Ethan Allen Catalog, 64th edition, © 1962, p. 70, stackable stool, bottom left.

B 479,681
COMBINED TOOTHBRUSH HOLDER AND BRACKET
John Madison Harris, P.O. Box 2819, West Palm Beach, Fla. 33402
Filed July 2, 1974, Ser. No. 479,681
Int. Cl. D23—*02*
U.S. Cl. D6—94

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1,409,701	3/1922	Giles	D6—94 X
1,527,832	2/1925	Bragg et al.	D6—94 X

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Sears Catalog, Fall/Winter 1972, item 16, rural mailbox.

B 500,408
ELECTRONIC CALCULATOR
Lewis H. Herr, 122 County Line Road, Lansdale, Pa. 19446; Paul W. Porter, 609 Stony Way, Norristown, Pa. 19403; and John S. Kovacs, 3011 Congress Road, East Norriton, Pa. 19403
Filed Aug. 26, 1974, Ser. No. 500,408
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

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D. 227,472	6/1973	Hikawa	D26—5 C
D. 230,484	2/1974	Yamagami	D26—5 C
D. 233,347	10/1974	Beitler et al.	D26—5 C
D. 227,472	6/1973	Yamamoto et al.	D26—5 C

B 502,381
CLIP-ON LEVEL FOR PORTABLE ELECTRIC DRILLS
Philip E. Shaffer, 2010 S. Broadway, Grand Junction, Colo. 81501
Filed Sept. 3, 1974, Ser. No. 502,381
Int. Cl. D10—*04*
U.S. Cl. D10—69

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3,188,748	6/1965	Moody	33—373
2,806,296	9/1957	Weichert	33—390
2,756,512	7/1956	Pettit	33—372

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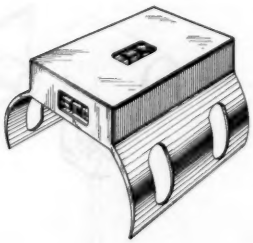

B 517,273
TRUCK BODY MOUNTED REFRIGERATION UNIT
William A. Forsty, Murrysville, Pa., and Donald K. Mayer, Bloomington, Minn., assignors to Thermo King Corp., Minneapolis, Minn.
Filed Oct. 22, 1974, Ser. No. 517,273
Int. Cl. D23—*04*
U.S. Cl. D23—142

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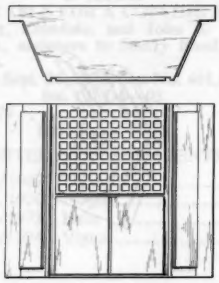
UNITED STATES PATENTS

D. 226,087	1/1973	Forsty et al.	D23—142
3,421,340	1/1969	Von Berg	62—239

FOREIGN PATENTS

556,197	4/1958	Canada	296—24 B
791,694	3/1958	Great Britain	296—24 B

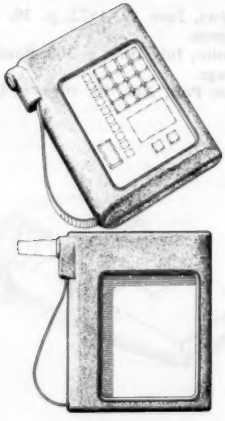


B 534,334
HOUSING FOR MOTOR VEHICLE DIAGNOSTIC EQUIPMENT
Mace Bell, Rowayton, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed Dec. 19, 1974, Ser. No. 534,334
Int. Cl. D14—*02*; D10—*05*
U.S. Cl. D26—5 C

References Cited

UNITED STATES PATENTS

D. 213,962	4/1969	Potruch	D10—78
D. 228,914	10/1973	Mackenzie	D10—75
3,889,273	6/1975	Deiss et al.	346—33 R



REISSUES

MARCH 16, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,735

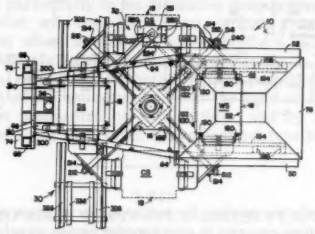
CYCLICLY-OPERABLE MACHINE ADAPTED TO PRODUCE AND ASSEMBLE COPE AND DRAG MOLD PARTS

Robert S. Lund, Elmhurst, and Vernon J. Koss, Niles, both of Ill., assignors to Pettibone Corporation, Chicago, Ill.

Original No. 3,828,840, dated Aug. 13, 1974, Ser. No. 233,438, Mar. 10, 1972. Application for reissue May 8, 1975, Ser. No. 575,659

Int. Cl.² B22C *15/28*

U.S. Cl. 164—195 18 Claims



1. In a cyclicly-operable mold-forming machine for simultaneously producing cope and drag mold parts and thereafter assembling them to produce a composite mold, in combination, a framework establishing a working station where the mold parts are produced and a stripping station where said mold parts are assembled, a fixed match plate support located at said working station, a pattern-carrying match plate associated with said support, upper and lower squeeze plates positioned above and below said support, an upper reaction platen and a lower lifting platen located at said stripping station, a flask carrier having a pair of upper and lower vertically spaced and relatively fixed flask supports, cope and drag flask sections normally and removably resting by gravity on said flask supports respectively and positioned in spaced apart relation, said carrier being movable between a first position at said working station wherein said flask supports straddle the match plate support and a second position at said stripping station wherein said flask supports are interposed between said platens, means located at said working station and operative when the carrier is in its first position to lift the match plate and the flask sections vertically from their respective supports, to assemble said match plate and flask sections to define upper and lower flask cavities on opposite sides of the match plate, to introduce sand *by air under pressure* into such cavities *simultaneously while the cope flask section is in overlying relation with the drag flask section* and *then* compress the [same] *sand in said cavities in order* to produce cope and drag mold parts within the flask sections, and to restore the match plate and also the flask sections with the mold parts therein to their normal positions on their respective supports, means located at said stripping station and operative when the carrier is in its second position to move said flask sections and platens relatively to one another so as to lift the flask sections vertically from their respective supports, to assemble said flask sections upon each other in order to establish the composite mold, to force the mold from the flask sections, and to restore the empty flask sections to their normal positions on their respective supports, and means for successively moving said carrier between said first and second positions.

Re. 28,736

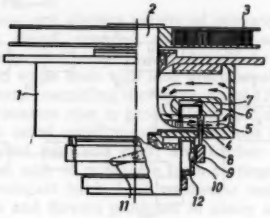
MEANS AND METHOD FOR REGULATING A HYDRAULIC ENERGY ABSORBING DEVICE

Lars Halvar Myhr, Newark, Del., and Lars-Åke Erling Svenson, Aby, Sweden, assignors to Borgs Fabriks Aktiebolag, Norrkoping, Sweden

Original No. 3,739,884, dated June 19, 1973, Ser. No. 140,853, May 6, 1971. Application for reissue Dec. 27, 1974, Ser. No. 536,733

Int. Cl.² F16F *57/04*

U.S. Cl. 188—296 8 Claims



1. A control device for regulating the driving torque and energy absorption in a hydraulic energy absorbent for aircraft arresting device and the like comprising a housing containing the liquid energy absorbent, a rotative shaft extending through said housing, said shaft supporting a series of radially arranged blades forming a ring adapted to rotate adjacent the bottom of said housing, a series of stationary vanes surrounding said blade ring within said housing, said blades and said vanes being curved in relatively opposite directions, a stationary ring member within said housing superposed on said vanes, an annular channel in said ring member having an annular recess facing said blades, an annular capsule having a generally U-shaped cross section reciprocably accommodated in said recess with the legs thereof adapted to slide over and cover said blades, said capsule engaging one end of a rod slidably engaging the bottom wall of said housing, the other end of said rod extending beyond said bottom wall and being connected to an axially adjustable member having guide means engaging an inclined groove located in a movable operating member connected to the bottom wall of said housing and being effective by movement thereof to adjust said rods to raise and lower said capsule over said blades whereby to control the torque from zero to maximum without liquid removal.

Re. 28,737

PROCESS FOR SYNTHESIZING SPECIFIC COMPLETE MIXED POLYOL ESTERS

Jerry Joseph Yetter, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Original No. 3,809,711, dated May 7, 1974, Ser. No. 242,139, Apr. 7, 1972. Application for reissue Oct. 31, 1974, Ser. No. 519,499

Int. Cl.² C11C *3/02*

U.S. Cl. 260—410.7 20 Claims

1. A process for preparing specific complete mixed polyol esters from [unsymmetrically substituted] partial polyol esters with substantially no ester group rearrangement comprising esterifying [said] *a* partial polyol [esters] *ester* with an acid anhydride in the presence of a catalytic amount of a member selected from the group consisting of perfluoroalkyl sulfonic acids and perfluoroalkyl sulfonic acid anhydrides, *said partial polyol ester being selected from the group*

consisting of partial polyol esters from aliphatic diols having the hydroxyl groups unsymmetrically substituted with respect to the carbon chain and partial polyol esters from aliphatic polyols containing at least three hydroxyl groups.

Re. 28,738

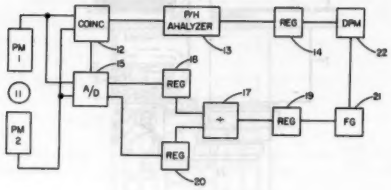
QUENCH CORRECTION IN LIQUID SCINTILLATION COUNTING

Gerardus Huibrecht Kulberg, Amstelveen, and Roedolf Hendrik Deinert, Mijdrecht, both of Netherlands, assignors to G. D. Searle & Co., Des Plaines, Ill.

Original No. 3,780,289, dated Dec. 18, 1973, Ser. No. 225,234, Feb. 10, 1972. Application for reissue Aug. 19, 1974, Ser. No. 498,271

Int. Cl.² G01T *1/20*

U.S. Cl. 250—362 **14 Claims**



1. A method for determining counting efficiency using a liquid scintillation radiation detecting and counting apparatus having [pulse amplitude accumulative means for pulses generated by photodetecting means as a result of] *photodetecting means responsive to* scintillations caused by radioactive events in a liquid sample containing a known radioactive source *to generate pulses having an amplitude spectrum, and pulse amplitude accumulative means,* comprising: passing the aforesaid pulses to said pulse amplitude accumulative means to produce a cumulative integral sum of pulse amplitudes *ranging upwardly from a* detection threshold, counting the number of pulses contributing to the cumulative integral sum of pulse amplitudes, dividing the integral sum of pulse amplitudes by the number of pulses to ascertain an average pulse amplitude, and determining average pulse collection efficiency as a function of said average pulse amplitude.

Re. 28,739

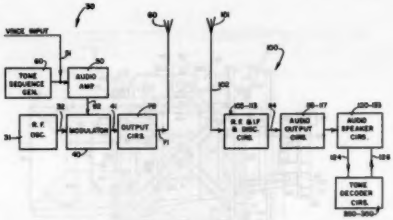
TONE CONTROL CIRCUIT HAVING A FREQUENCY CONTROLLABLE FILTER

Keith H. Wycoff, 1205 N. Tyler St., Lexington, Nebr. 68850

Original No. 3,597,690, dated Aug. 3, 1971, Ser. No. 666,645, Sept. 11, 1967. Application for reissue June 11, 1973, Ser. No. 368,946

Int. Cl.² H04B *1/04*

U.S. Cl. 325—55 **65 Claims**



41. A selective receiver for indicating the presence of a predetermined tone grouping in tone encoded paging signals comprising electric filter means sequentially tunable to pass individual tones of said grouping in a predetermined order, means for detecting said tone encoded signals and coupling same to the input of said filter means, sequence detector means coupled to the output of said filter means and arranged to cause said filter means to pass sequentially in said predetermined order the tones of said grouping upon the prior passage of preceding tones of said tone grouping, and indicator means responsive only to the passage through said filter means of the last of the tones of said grouping for indicating said receiver is being paged.

PLANT PATENTS

GRANTED MARCH 16, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,841
BEGONIA PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Feb. 28, 1974, Ser. No. 446,785
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of *elatior* begonia characterized particularly by its distinctive deep golden orange flower color; semi-dwarf and short compact growth characteristics; close internodes which produce a compact plant; relatively small flowers, approximately 5–7 cm. in diameter; easy rooting characteristics; production of a profusion of adventitious shoots at the base of leaf petioles when propagated by leaf cuttings, and by its more floriferous habit than other Schwabenland type begonias.

3,842
PASPALUM VAGINATUM GRASS PLANT

Hubert F. Whiting, Indio, Calif., assignor to Nan Hutchinson, Phoenix, Ariz., and Hubert F. Whiting, Indio, Calif., fractional part interest to each

Filed May 2, 1974, Ser. No. 466,265
Int. Cl. A01h *5/12*
U.S. Cl. Plt.—88 **1 Claim**

1. The variety of *Paspalum vaginatum* grass plant, substantially as described and illustrated.

3,843
KALANCHOE PLANT

Adolf Grob, St. Gallen, Switzerland, assignor to Mikkelsens Inc., Ashtabula, Ohio

Filed Sept. 25, 1974, Ser. No. 509,131
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Kalanchoe characterized particularly by its dark pink colored flowers; abundant flowering, compact growth habit; and large flat single flowers.

3,844
MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Oct. 7, 1974, Ser. No. 512,629
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—8 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, rounded, much branched, bush type, substantially as illustrated and described, characterized by pointed white buds with long green sepals and double white flowers resembling the White Angel (Plant Pat. No. 3,538) miniature rose in general form of bud and flower; the petals being more rounded at the tips and the buds often flushed with soft pink; and further characterized by a plant, easy to propagate from cuttings, of vigorous growth, compact habit, healthy, disease resistant foliage, with buds and flowers produced in above average abundance in loose spray or cluster.

3,845
ROSE PLANT

Samuel McGredy IV, Auckland, New Zealand, assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Nov. 6, 1974, Ser. No. 521,366
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—11 **1 Claim**

1. The new and distinct variety of hybrid tea rose plant substantially as herein illustrated and described, which is characterized by a plurality of the following features, in combination, namely a vigorous upright many-branched habit of growth, with glossy medium-sized foliage, having somewhat better resistance to mildew than plants of the same genus grown under comparable conditions; a nearly continuous blooming habit throughout the season; blooms which have a bi-colored effect of orange-salmon on the upper petal surfaces, and off-white lower surfaces, margined with orange-salmon; a strong citrus-like fragrance; each flowering stem usually carrying a single flower, yet developing relatively medium length blooming stems from upper axillary buds; the flower size ranging from four to four and one-half inches.

PATENTS

GRANTED MARCH 16, 1976

ERRATA

For CLASS	See PATENT NO.
197–053	3,944,052
241–285 A	3,944,091
296–063	3,944,201
424–345	3,944,652
272–060 R	3,944,654
426–032	3,944,655
427–288	3,944,701
179–001 VC	3,944,736
290–040 R	3,944,837

PATENTS

GRANTED MARCH 16, 1976

GENERAL AND MECHANICAL

NOTE – A cross reference listing of applications published under Trial Voluntary Protest Program on January 28, 1975 is located in the back of this Issue. These entries will be in numerical order by document publication number.

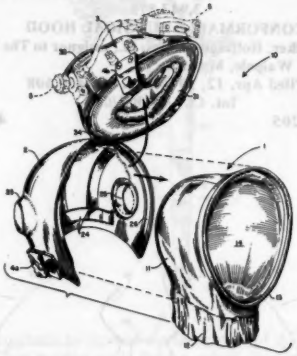
3,943,571
PROTECTIVE HELMET

Marvin C. Boatman, P.O. Box 1105, Patterson, La. 70392

Continuation-in-part of Ser. No. 409,296, Oct. 24, 1973, abandoned. This application Feb. 7, 1975, Ser. No. 547,971

Int. Cl.² A62B *17/04*; B63C *11/12*

U.S. Cl. 2—2.1 R **13 Claims**



1. A diver's helment comprising:

flexible, elastic, inner hood means for covering all of the diver's head and neck in relatively close proximity thereto except for the facial portions thereof, said hood means having a facial opening around the area which is placed in proximity to the facial portions of the diver and having a hood sealing member around said opening, said hood means having a constricted neck opening for forming a water-tight seal around the neck portion of the diver; and

a separate, rigid, protective outer helmet having a transparent face plate mask portion therein and having a helmet sealing member around said face plate mask portion; said outer helmet and said hood being two structurally separate elements which can be temporarily joined together during use as a diving helmet to form a water-tight seal but which can be relatively easily separated for bail-out purposes; said transparent face plate mask portion and said facial opening being aligned together and said helmet sealing member and said hood sealing member being connected together to form a water-tight seal when said protective helmet and said hood are joined together; the hood and said transparent face place portion forming a dry enclosure around the entire head of the diver when the diving helmet is in use to keep the head dry.

3,943,572
HELMET RETENTION SYSTEM

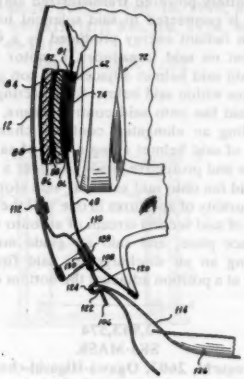
Jackson A. Aileo, Carbondale, Pa., assignor to Gentex Corporation, Carbondale, Pa.

Filed June 10, 1974, Ser. No. 477,785

Int. Cl.² A42B *1/24*, *3/00*

U.S. Cl. 2—3 R **27 Claims**

1. A helmet assembly including in combination, a rigid outer shell, respective left hand and right hand earcup assembly supports of flexible material, respective earcup assemblies carried by said supports, means for securing said supports adjacent to the upper ends thereof to said rigid outer shell at first locations thereon for movement of said earcup assemblies toward and away from the wearer's head, an adjustable chinstrap assembly, means for securing the ends of said chinstrap assembly to said rigid outer shell at second locations thereon below said first locations and means for connecting said chinstrap assembly at spaced locations intermediate the ends thereof to said earcup assembly supports adjacent to the lower ends thereof to move said earcup assemblies toward the wearer's head as said chinstrap assembly is actuated to hold said shell on the wearer's head.



3,943,573
AUTOMATIC PROTECTIVE SHADE EQUIPMENT ON PROTECTIVE VISORS, PROTECTIVE HELMETS OR PROTECTIVE GOGGLES, PARTICULARLY FOR FUSION WELDING

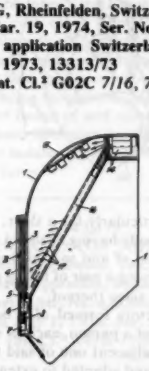
Hermann Budmiger, Seewen, Switzerland, assignor to UTP Arbeitsschutz AG, Rheinfelden, Switzerland

Filed Mar. 19, 1974, Ser. No. 452,580

Claims priority, application Switzerland, Mar. 26, 1973, 4377/73; Sept. 17, 1973, 13313/73

Int. Cl.² G02C *7/16*, *7/12*

U.S. Cl. 2—8 **1 Claim**



1. Automatic protective equipment for welders comprising a welding helmet having a transparent outer face plate mounted at a fixed position thereon, a planar protective shade mounted on said helmet closely adjacent to and in generally parallel relation to said face plate at a position between said face plate and the eyes of a wearer of said helmet, said protective shade comprising first and second transparent planar elements mounted for relative linear movement through a predetermined limited distance in a direction parallel to said face plate to selectively define a viewing aperture the width of

which is related to said limited distance, an electrically energizable solenoid within said helmet at a position below said protective shade, the armature of said solenoid being connected to one of said planar elements for moving said one planar element in translation in a first direction through said limited distance relative to the other of said planar elements when said solenoid is energized, spring means for urging said one planar element in a second direction opposite to said first direction when said solenoid is de-energized, control means carried by said helmet for controlling the energization of said solenoid, said control means comprising a transducer responsive to incident radiant energy, said transducer being connected to a battery-powered transistorized amplifier the output of which is connected to said solenoid to energize said solenoid when radiant energy produced by a welding operation is incident on said transducer, a motor driven air fan mounted within said helmet adjacent the top of said helmet, air guide means within said helmet for directing a first stream of air from said fan onto said control means, said air guide means including an elongated confined channel extending from the top of said helmet along a side of said helmet past said face plate and protective shade to direct a second stream of air from said fan onto said solenoid, said elongated channel including a plurality of apertures in one wall thereof for diverting a portion of said second stream of air onto said protective shade and face plate, and said air guide means including means defining an air discharge for said first and second streams of air at a position adjacent the bottom of said helmet.

3,943,574

SKI-MASK

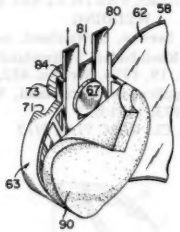
Takeshi Yamaguchi, 2603, Ogawa-Higashi-cho, Kodaira, Tokyo, and Koichiro Imai, 2-6-9, Kokubu-cho, Ichikawa, Chiba, both of Japan

Filed Sept. 27, 1974, Ser. No. 509,841

Claims priority, application Japan, Oct. 5, 1973, 48-116123[U]; Oct. 5, 1973, 48-116124[U]

Int. Cl.² A41D *13/00*

U.S. Cl. 2—9 **9 Claims**



1. A face shield, particularly for a skier, comprising:

a transparent mask body having a curved surface adapted to be disposed in front of and spaced from a person's face, said mask body having a pair of fitting portions extending from the opposite sides thereof;

a pair of ear protectors formed of a bowl-like shape for covering the ears of a person, each of said ear protectors being positioned adjacent one of said fitting portions;

an elongated head band adapted to extend over and engage the person's head for supporting the face shield, the head band having opposite end portions terminating at and engaged with the ear protectors; and

a pair of connecting means for interconnecting each fitting portion to the adjacent ear protector and the adjacent end portion of the head band;

said connecting means including first means for permitting swinging movement of the mask body relative to the ear protector so that the mask body can be swingably moved by the person into a selected position relative to the person's head, said connecting means also including second means coacting with said first means for fixedly interconnecting said mask body to said ear protectors in said selected position;

said connecting means further including third means coacting between the end portion of the head band and the adjacent ear protector for longitudinally adjusting the position of the head band relative to the ear protector to thereby adjust the band so that it is able to accommodate different head sizes.

3,943,575

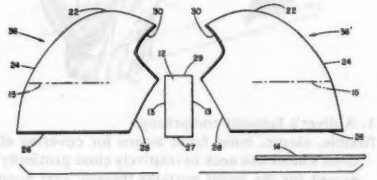
CONFORMABLE SURGICAL HOOD

James H. Bolker, Hoffman Estates, Ill., assignor to The Kendall Company, Walpole, Mass.

Filed Apr. 12, 1974, Ser. No. 460,608

Int. Cl.² A42B *1/04*

U.S. Cl. 2—205 **4 Claims**



1. A conformable disposable operating room surgical hood adapted for wear with or without a face plate and exhaust system, said hood comprising

two similar generally flat flexible non-woven, fluid resistant, inelastic side sections, the perimeter of each side section including

a crown portion

a back portion adjacent said crown portion

a shoulder edge portion adjacent said back portion

a lower face portion adjacent said perimeter shoulder edge portion, and

an upper face portion between said lower face portion and said crown portion,

said crown and back perimeter portions of said two side sections being joined together, generally centrally of said hood,

an air permeable resiliently expandable inset portion joining said side section perimeter lower face portions, and

resiliently expandable gathering means, secured to said side sections, said gathering means being secured to said side sections in stretched condition and tending to maintain said side sections across at least a portion of the rear thereof in gathered configuration,

whereby said hood is conformable and size variable and is adapted to be worn over a face plate used with an exhaust system, said hood admitting air through said inset portion, or without such apparatus over a surgical mask alone, limiting bacterial contamination from the hood of the wearer, and tending to maintain sterile operating room conditions.

3,943,576

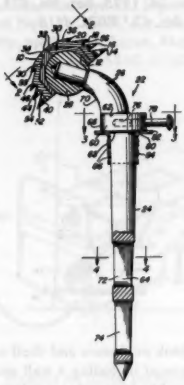
ARTIFICIAL HIP JOINT MADE FROM TWO DIFFERENT SURGICAL ALLOYS

Konstantin Mitrofanovich Sivash, ulitsa Bolshaya Pirogovskaya, 37/43-A, kv. 49, Moscow, U.S.S.R.

Division of Ser. No. 189,261, Oct. 14, 1971, Pat. No. 3,820,167. This application Nov. 9, 1973, Ser. No. 414,431

Int. Cl.² A61F 1/24

U.S. Cl. 3—1 5 Claims



1. A prosthesis to replace a missing part of the body comprising a first portion made from a cobalt alloy and a second portion made from titanium or a titanium alloy, said alloys being of a surgical grade, said first and second portions being in physical contact.

3,943,577

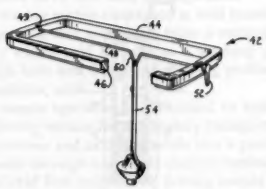
TOILET TANK FLUSH CONTROL

Homer H. Woolf, 16409 E. 32nd St., Independence, Mo. 64055, and Lucille M. Woolf, both of 16409 E. 32nd St., Independence, Mo. 64055

Filed Apr. 17, 1975, Ser. No. 569,004

Int. Cl.² E03D 1/34, 5/02; A61B 19/00

U.S. Cl. 4—67 R 4 Claims



1. For use with a toilet tank having a flush box, a lid closing said box, an outlet communicating the flush box with the toilet; a valve normally closing said outlet and movable to an open position to allow the passage of water through the outlet; and means for opening and closing said valve; the improvement comprising:

a framework adapted to be seated on said box at the upper periphery thereof,

said framework being adapted to receive said lid and hold the latter on the box to close the latter;

handle means traversing the framework and projecting on the outside of the flush box; and

means adapted for coupling said handle means with said valve whereby movement of the handle means opens the valve to allow the passage of water through said outlet.

3,943,578

METHOD AND APPARATUS FOR DEODORIZING THE DIPPING UP SYSTEM OF A LAVATORY

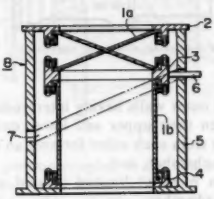
Masami Miya; Masao Nagasaki, both of Tokyo, and Shuichi Harada, Asaka, all of Japan, assignors to Nepon Kabushiki Kaisha (Nepon Inc.), Tokyo, Japan

Filed Aug. 14, 1974, Ser. No. 497,352

Claims priority, application Japan, Aug. 16, 1973, 48-91335; Dec. 27, 1973, 48-144381; Dec. 27, 1973, 48-144382; Sept. 19, 1973, 48-108822[U]; Dec. 27, 1973, 48-147594[U]; Dec. 27, 1973, 48-147595[U]; Dec. 27, 1973, 48-147596[U]; Dec. 27, 1973, 48-147597[U]; Dec. 27, 1973, 48-147598[U]; Dec. 27, 1973, 48-147599[U]; Feb. 16, 1974, 49-18150[U]; Feb. 16, 1974, 49-18151[U]; Feb. 16, 1974, 49-18152[U]; Feb. 16, 1974, 49-18153[U]

Int. Cl.² A47K 11/02

U.S. Cl. 4—128 13 Claims



1. Apparatus for deodorizing a lavatory of the type including a lavatory bowl having an outlet port which communicates with excrement reservoir comprising a valve including first and second coaxial cylindrical membranes having equal inner diameters and equal lengths, each of said membranes having respective corresponding first and second opposite ends, a first flange secured to said first end of said first membrane, a third flange secured to said second end of said second membrane, a second flange commonly secured to said second end of said first membrane and said first end of said second membrane, said first and second membranes being reciprocably angularly displaceable about their common longitudinal axis by 180° relative to each other without elastically deforming either of said membranes, and a first sleeve having first and second opposite ends, said opposite ends of said first sleeve having respective first and second registerable apertures therein, said valve being mounted in said first sleeve, said first flange and said third flange of said valve respectively underlying and overlying said apertures in said first sleeve so as to permit said valve to isolate an odorous material from said first membrane of said valve.

3,943,579

INCINERATOR TOILET

Ernest Bayne Blankenship, Dallas, Tex., assignor to Research Products/Incinolet Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 445,662, Feb. 25, 1974. This application July 1, 1974, Ser. No. 484,954

Int. Cl.² A47K 11/02

U.S. Cl. 4—131 18 Claims

1. An incinerator toilet comprising:

housing structure,

an incinerator chamber means located in said housing structure and having an upper end and a lower end with a central opening extending therethrough,

bowl means located above said chamber means,

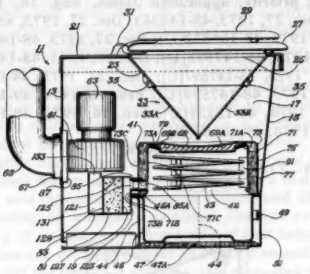
a removable pan adapted to be located below said lower end of said chamber means,

heating means located within said central opening of said chamber member,

said incinerator chamber means comprising:

inner and outer walls each of which are formed from a single cylindrical piece of drawn metal,

said inner and outer walls having at their upper ends inwardly extending flanges connected together and at their lower ends outwardly extending flanges connected together,



said inner and outer walls having intermediate wall portions between their upper and lower ends which are spaced apart from each other forming an enclosed and surrounding chamber, and

heat insulation material located in said enclosed and surrounding chamber.

3,943,580

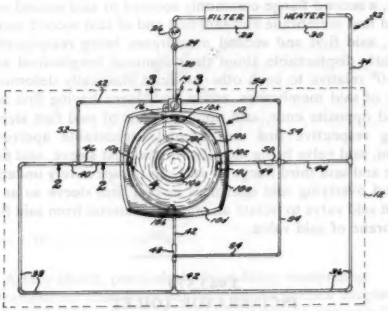
THERAPEUTIC POOL SYSTEM

Don W. Carter, 19182 Hamden Lane, Huntington Beach, Calif. 92446

Filed Dec. 23, 1974, Ser. No. 535,157

Int. Cl.² E04H 3/16, 3/20

U.S. Cl. 4—172.15 **3 Claims**



1. A therapeutic pool system comprising in combination,

a pool to be filled with fluid to a predetermined level having a bottom wall and continuous side wall, and being formed with an outlet and an inlet,

a circulation system for fluid in said pool comprising conduit means having a fluid pump therein and connected between said outlet and inlet,

a skimmer in said circulation system comprising a housing adapted to be only partially filled with fluid circulating in said circulation system,

means for heating the fluid in said pool and circulation system,

one or more pipes connected to said housing above the level of fluid therein and to said pool below the level of fluid therein, and means in said pipes for creating a pressure drop along said pipes to cause air to be drawn into said pipes from above the fluid in said skimmer and to be discharged into said pool below the fluid level therein.

3,943,581

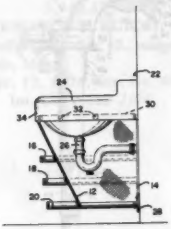
COMBINATION SINK ENCLOSURE AND SHELF ASSEMBLY

Gil Reyes, San Francisco, Calif., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Apr. 24, 1975, Ser. No. 571,485

Int. Cl.² E03C 1/18

U.S. Cl. 4—187 R **10 Claims**



1. A combination sink enclosure and shelf assembly for use in a lavatory arrangement including a wall and a sink affixed to said wall, said assembly comprising a substantially inverted frustotrapezoidal housing, a plurality of shelves, means for securing said shelves to said housing in vertically spaced and horizontally disposed relationship, and means for securing said housing to said wall in proximal relationship beneath said sink.

3,943,582

HOLDER FOR ADDITIVE TO FLUSHING WATER

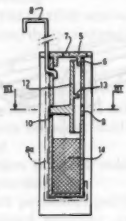
Jean Daeninckx, and Pierre Lelaquet, both of Paris, France, assignors to L'Oreal, Paris, France

Filed Sept. 12, 1974, Ser. No. 505,269

Claims priority, application France, Sept. 21, 1973, 73.33967

Int. Cl.³ E03D 9/03

U.S. Cl. 4—227 **11 Claims**



1. In a container for holding an additive which is to be progressively dissolved in flushing water when said container is immersed in a tank in which the flushing water is held, said container having a removable cover defining an outlet orifice therein, a water inlet orifice between said container's top and bottom, means for positioning said container in said tank with said inlet between the maximum and minimum levels of the water in said tank, and a supply of additive in said container beneath said inlet, the improvement which comprises a deflector positioned within said container in alignment with and opposite said inlet, with said deflector's lower edge above the upper surface of said additive, said deflector degining, between it and the wall of said container in which said inlet is formed, a vertical passage extending from a first open end

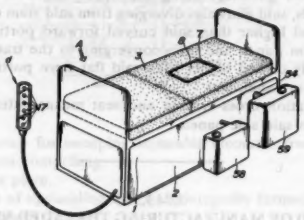
above said inlet to a second open end below said inlet, through which passage water entering through said inlet is deflected by said deflector against said upper surface of said additive, said passage having a cross-sectional dimensions parallel to said wall which is substantially greater than the width of said inlet.

3,943,583

BED WITH A COMMODE

Yoshitaka Ishikawa, Matsuyama, Japan, assignor to Daika Kabushiki-Kaisha, Matsuyama, Japan

Filed Nov. 26, 1974, Ser. No. 527,279
Claims priority, application Japan, May 28, 1974, 49-59983
Int. Cl.² A61G *07/02*
U.S. Cl. 5—90 **9 Claims**



1. A bed for invalids or other persons comprising:
a bed frame;
a main mattress covering said bed frame, said main mattress provided with a through-hole at a location corresponding with the thighs of a person lying on the bed, said through-hole communicating with the interior of said housing portion;
a housing portion disposed entirely below said main mattress;
an auxiliary mattress sized to fit into said through-hole;
first driving means contained in said housing portion and connected to said auxiliary mattress for movably supporting said auxiliary mattress at a working position registered with said through-hole and for transporting said auxiliary mattress from said working position to a resting position completely within said housing and from said resting position to said working position;
a commode normally disposed within said housing position and sized to fit into said through-hole;
second driving means contained in said housing position for transporting said commode from a resting position completely within said housing to a working position in said through-hole and from said working position to said resting position; and
control means operatively connected to said first and second driving means for alternately transporting said auxiliary mattress and said commode into a position registered with said through-hole, said control means allowing only one of said first and second driving means to be actuated at one time.

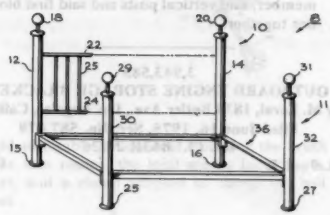
3,943,584

BED FRAME ARRANGEMENT

Joseph P. Sonessa, 4249 Saugus, Sherman Oaks, Calif. 91403

Filed Jan. 13, 1975, Ser. No. 540,660
Int. Cl.² A47C *19/00, 23/00*
U.S. Cl. 5—299 **4 Claims**

1. In a bed arrangement of the type having a frame means defining an open, right angle, quadrilateral configuration lying in a substantially horizontally disposed plane, a headboard and a footboard spaced from the headboard and said headboard and footboard lying in substantially vertical planes, and each of said headboard and footboard having corner posts at the ends thereof and each of said corner posts having foot members for supporting the bed, and said frame means coupled to each of said corner posts and spaced vertically upwardly from said feet members, the improvement comprising, in combination:
said frame means comprising a pair of transverse frame members and a pair of lengthwise frame members;
joining means for detachably joining together said transverse frame members to said lengthwise frame members at the corners of said right angle quadrilateral configuration of the frame means, and said joining means for coupling said frame means to each of said corner posts, and said joining means comprises:
first block members, one at each end of said transverse frame members and each having:



a lug portion coupled to the end of said transverse frame members;
a body portion extending beyond the ends of said transverse frame members, and said body portion having:
side walls defining a cavity, and:
a first of said side walls having an external surface having a geometric configuration corresponding to the outside geometric configuration of said corner posts and adjacent thereto, and said first side wall having a plurality of bolt-accepting apertures therethrough, said corner posts having walls in regions adjacent to said side wall of said first block members defining a tubular configuration and having a plurality of apertures therethrough aligned with said plurality of apertures in said first side wall of said block member;
a second side wall of said body portion of said first block member oppositely disposed and spaced from said first side wall and having walls defining a tongue portion receiving aperture therethrough;
a pair of spaced apart wing members coupled to said second side wall of said body portion of said first block member in said cavity defining a tongue accepting groove therebetween, and said wing members progressively increasing in thickness from a thin end adjacent the top of said aperture in said second side wall to a thick end adjacent the bottom of said aperture in said second side wall;
a pair of second block members having lug portions, one of said second block members coupled by said lug portion thereof to each end of said lengthwise frame members and having:
a pad portion extending beyond the ends of said lengthwise frame members;
a tongue portion extending from said pad portion and positionable through said aperture in said second side wall of said body portion of said first block member in said groove defined by said pair of spaced apart wing members; and,
an enlarged head portion coupled to the outer end of said tongue portion for frictionally clamping engagement with said tapered wing members in the interior of said cavity, whereby said taper in said wing members provides a clamping, wedging frictional retention of said second block member in right angular relationship to said first block mem-

ber and said lengthwise frame members in right angle and substantially horizontally coplanar relationship to said transverse frame members;

a clamping means positioned in the interior of said tubular portion of said vertical posts adjacent said apertures through said wall of said tubular posts, and said clamping member having bolt-accepting apertures therethrough aligned with said apertures in said wall of said vertical posts, and bolt means extending through said bolt-accepting apertures in said first side wall of said body portion of said first block member, through said apertures in said wall of said vertical posts and through said bolt-accepting apertures in said clamping member, and nut means for engaging said bolt means for clamping said clamping member, said vertical posts and said first block member together.

3,943,585

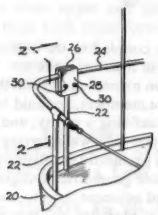
OUTBOARD ENGINE STORAGE BRACKET

Murray M. Leral, 1834 Butler Ave., Los Angeles, Calif. 90025

Filed June 16, 1975, Ser. No. 587,079

Int. Cl.² B63H *21/26*

U.S. Cl. 9—1 R **10 Claims**



1. A device for storing an outboard engine on a boat comprising first and second generally flat members, each having first and second surfaces, and means for clamping said first and second members together, at least one of said first and second members having a depression on said first surface thereof to mate with a railing on a boat, said means for clamping said first and second members together being a means for clamping said first and second members together with said first surfaces into a face-to-face disposition with a railing therebetween, whereby said first and second members may be supported by the railing to provide a transom-like assembly for support of an outboard engine.

3,943,586

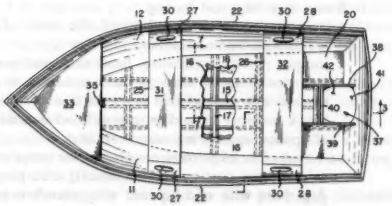
DORY

John D. Palmer, 7702 Speedway, Everett, Wash. 98203

Filed Dec. 23, 1974, Ser. No. 535,182

Int. Cl.² B63B *3/09*

U.S. Cl. 9—6 M **7 Claims**



1. A dory comprising:

a bottom panel having a stern edge, a bow end, and symmetrical side edges diverging aft for their full length from said bow end to the ends of said stern edge, said bottom panel having a flat stern portion extending from said stern edge forwardly approximately half the length of the dory and having a generally trapezoidal shape defined on three sides by said stern edge and rear portions of said diverging side edges, and said bottom panel having a curved forward position curving upwardly uniformly across its width from the fourth side of said stern portion forwardly between said side edges to said bow end,

a transom sloping aft from a connection with said stern edge and having opposed upwardly diverging end edges,

opposed outwardly sloping side panels connected to said end edges of the transom and side edges of the bottom and connected together at the bow to form a forwardly sloping stem,

respective gunwales along the upper edges of said side panels, said gunwales diverging from said stem outwardly of and higher than said curved forward portion of the bottom panel, and then converging to the transom outwardly of and higher than said flat stern portion of the bottom panel, and

combination cross-bracing and seat means extending between said side panels.

3,943,587

METHOD OF MANUFACTURING THREADED NUTS AND THREADED NUT ARTICLES PRODUCED BY SUCH METHOD

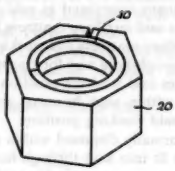
Segismundo Nates Lasky, Calzada de Tlalpan 413, Mexico City 13, Mexico

Filed July 18, 1975, Ser. No. 597,387

Claims priority, application Mexico, Nov. 25, 1974, 155120

Int. Cl.³ B21D *53/24*; B21K *1/64*

U.S. Cl. 10—1 A **5 Claims**



1. A method of manufacturing a threaded nut article comprising the steps of:

providing a coil spring insert having a plurality of connected together coils the inner edges of which defines a screw thread;

providing a hollow nut casing having an outer profile in the shape of a nut, an inner opening extending through said nut casing and dimensioned to receive therein said coil spring insert, and at least one radial slit extending the length of said nut casing effective to render said nut casing slightly deformable and inwardly contractible when radial inward pressure is applied thereto;

positioning said coil spring insert into the nut casing inner opening;

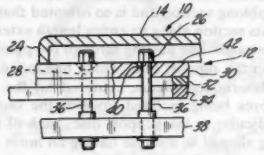
applying sufficient radial inward pressure to said nut casing to slightly deform and inwardly contract the same so as to compress it about said coil spring insert; and

connecting said nut casing and coil spring insert together during the application of said radial inward pressure to form a unitary threaded nut article.

3,943,588
APPARATUS FOR REMOVING A PLURALITY OF SEPERATE ELEMENTS AND METHODS OF UTILIZING SAME

Henry M. Kolbuch, 37290 Susan, Sterling Heights, Mich. 48077

Filed May 22, 1974, Ser. No. 472,302
Int. Cl.² B21K 27/00; B23G 11/00
U.S. Cl. 10—162 R 8 Claims

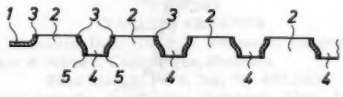


1. A device for sweeping separable elements from an unloading area comprising:
a. a base plate,
b. a pair of upstanding side walls integrally formed with the base plate,
c. a pair of upstanding short walls integrally formed with the side walls and the base plate,
d. an arcuate wall integrally formed with the base plate and the short walls, and
wherein the base plate is joined at each of the walls, the base plate and walls cooperating to define an open-topped, open-ended device.

3,943,589
GANGWAY ELEMENT

Peder Fahrsen Pedersen, Novling pr. Skibbild, 7400 Herning, Denmark

Filed Nov. 5, 1974, Ser. No. 521,087
Int. Cl.² E01D 15/12
U.S. Cl. 14—72 R 7 Claims



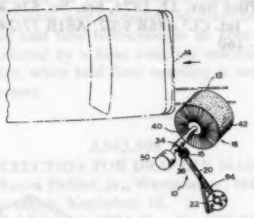
1. A gangway element of improved skid-proof properties, comprising a metal sheet having rows of large holes and small holes alternately, the size of the large holes being less than the width of the shoe of a person walking on said gangway, the holes in adjacent rows being out of registry so that each large hole is in alignment with a small hole of the adjacent rows, the edges of the large holes and the small holes being oblique with respect to the plane of the sheet, the edges of the large holes being pressed upwardly, the edges of the small holes being pressed downwardly, the edges of the larger holes merging with the edges of the small holes, whereby all the portions between the holes are inclined towards the small holes.

3,943,590
ROCKER PANEL BRUSH MECHANISM

Daniel C. Hanna, 1133 SW. Rivington Drive, Portland, Oreg. 97201

Filed Jan. 2, 1974, Ser. No. 429,930
Int. Cl.² B60S 3/06
U.S. Cl. 15—21 D 5 Claims

1. In a brush mechanism,
a brush assembly including a rotary brush rotatable on a predetermined axis,
movable arm means,
means mounting the arm means adjacent a predetermined path of a car,

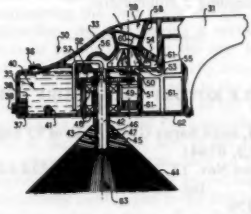


and rigid adjustable joint means mounting the brush means on the arm means, the joint means including a ball, a socket, and a clamp adapted to clamp the ball in the socket.

3,943,591
FLUID-PRODUCT PROJECTION APPARATUS FOR MAINTENANCE OF VARIOUS ARTICLES

Marie Marguerite Lanusse, 50, rue Pierre Charron, Paris 75008, France

Filed June 11, 1974, Ser. No. 478,398
Claims priority, application France, June 14, 1973, 73.21712
Int. Cl.² A46B 13/04
U.S. Cl. 15—29 5 Claims



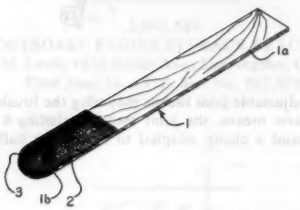
1. A fluid-product projection apparatus for maintenance of various articles comprising a body having a portion which forms a container for a fluid product, a working head rotatably mounted on said body, means for supplying fluid product to said working head, said working head being constituted by at least one rotatable member forming a brush, a motor in said body for for driving the brush in rotation and projecting means for projecting said fluid product into said brush member while the latter is rotating, the projecting means being constituted by at least a hollow shaft driven by said motor and carrying at one of its ends said rotatable member, a suction pipe extending into the container and having an open end extending into said hollow shaft with clearance within the latter and a centrifugal turbine mounted within the apparatus and driven by said motor to blow air through said hollow shaft and draw the fluid product from said container and into and through said hollow shaft.

3,943,592

TONGUE CLEANING DEVICE

Surindar N. Bhaskar, Washington, D.C.; Wayne J. Selting, Omaha, Nebr.; Eleanor L. Gilmore, Seminole, Fla., and Arthur Gross, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 22, 1974, Ser. No. 526,442
Int. Cl.[2] A46B *9/02*; A61B *17/24*
U.S. Cl. 15—160 1 Claim



1. A device to remove bacteria, cellular particulates and the like from the dorsal surface of the tongue comprising a planar, elongated member, filamentous strands disposed to provide a high density per unit area supported on the planar surface at an end portion of said elongated member, wherein the free ends of said strands are hooks which are oriented in random directions and concentrated to provide a density of over 400 hooks per square inch and wherein said elongated member and said filamentous strands in combination have a vertical profile not exceeding 3 millimeters.

3,943,593

DISPOSABLE ROTORY BRUSH CORE FOR POWER SWEEPER

William Gould, and Charna Gould, both of 93 Sagamore Road, Millburn, N.J. 07041

Filed Nov. 18, 1974, Ser. No. 524,645
Int. Cl.[2] A46B *13/02*
U.S. Cl. 15—179 5 Claims

1. A power driven rotary brush assembly comprising a drive shaft, a first plug member mounted proximate one end of said shaft and rotatable therewith, a second plug member mounted proximate on opposite end of said shaft and separable from said shaft, a coupling member affixed to said shaft axially inwardly of and proximate the inner end of said second plug member coupling means for separably connecting said second plug member to said coupling member by rotation therewith and for axially adjustably advancing said second plug member toward said coupling member, said plug members having frustoconical peripheral surfaces coaxial with said shaft tapering inwardly toward each other, and a brush member including a deformable tubular cylindrical core coaxial with said shaft and outwardly directed bristles supported by said core, said core having an inside diameter between the maximum and minimum diameter of said plug member frustoconical peripheral surfaces, and said plug members entering opposite ends of said core and wedge engaging and deforming the opposite inside borders of siad core to provide drive couplings therewith.

3,943,594

ROTARY BRUSH FOR ROAD-CLEANING MACHINES

Pierre L. Alvin, route de Limoges Mougon, 79230-Prahecq, France

Filed Dec. 2, 1974, Ser. No. 528,906
Claims priority, application France, Dec. 10, 1973, 73.44009
Int. Cl.[2] A46B *13/02*, *7/08*
U.S. Cl. 15—180 3 Claims

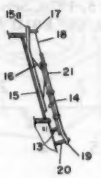
1. A rotary brush for road-cleaning machines, constituted by a support disc to which are attached a pluraliy of bundles of fibres, wherein each of the fibres constituting the said bundles is of oblong section and is so oriented that the largest dimension of its section along its entire length extends perpendicularly to a straight line passing through the point of fixation of said fibre to the support disc, which line is tangential to a circle of predetermined radius, centered on the axis of the brush, the fibres being inclined towards the outside in the plane perpendicular to the support disc, each of the bundles of fibres being shaped as a staple having an inner arm and an outer arm, during rotation the inner arm of each of the bundles preceding the outer arm.

3,943,595

WINDSHIELD WIPER

Lars Erik Lundin, Vastervik, and Dzintars Illmars Vieglins, Gamleby, both of Sweden, assignors to Aktiebolaget Electrolux, Lilla Essingen, Sweden

Filed Mar. 27, 1975, Ser. No. 562,783
Claims priority, application Sweden, Mar. 29, 1974, 7404250
Int. Cl.[2] B60S *1/32*
U.S. Cl. 15—250.23 4 Claims



1. A windshield wiper for a rectangular-shaped windshield comprising a wiper blade adapted to perform a swinging-wiping movement between spaced end positions located adjacent to one of the long sides of said rectangular-shaped windshield to produce a wiped surface, said wiper blade having an operative length that varies during the wiping movement of said wiper blade, said wiper blade in the central sector of the wiped surface between said end positions having an effective length which is substantially equal to the length of a short side of said windshield while said wiper blade in the other sectors of said wiped surface is greater in length, and said wiper blade in said central sector having a portion thereof extending beyond the other of said long sides of the rectangular-shaped windshield, and means for lifting said portion of the wiper blade located outside of said windshield above and without coming in contact with the latter while the remaining portion of the blade remains in contact with the windshield.

3,943,596

CLEANING OF TEXTILE CARDING MACHINES

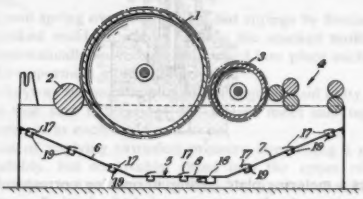
Thomas Henry Wright, Bury, and Robert Lane, Accrington, both of England, assignors to Platt International Limited, England

Filed July 24, 1974, Ser. No. 491,952

Claims priority, application United Kingdom, July 25, 1973, 35444/73

Int. Cl.² A47L 5/38; D01G 15/76

U.S. Cl. 15—301 **16 Claims**



1. A textile carding machine including pneumatic waste removal apparatus for removing trash and waste from beneath the carding machine, said apparatus comprising:

air supply means for supplying pressurized air;

trash and waste support means positioned beneath the carding elements of the machine and on which trash and waste are deposited;

a waste collection zone;

a plurality of nozzles arranged in spaced relation above the support means for emission of blasts of air from said air supply means to create a flow of air over said support means to transport trash and waste entrained thereby to said waste collection zone;

said nozzles being further arranged in a plurality of rows containing at least one nozzle each; and

an air supply distribution means to contribute said supply of pressurized air in turn and cyclicly to each of a plurality of preselected groups of said rows of said nozzles, said groups each consisting of at least one row of nozzles.

3,943,597

VACUUM CLEANER

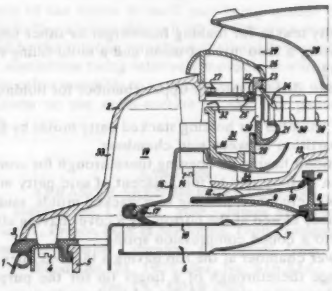
Hans Mathiesen Dall, Glostrup, Denmark, assignor to A/S Fisker & Nielsen, Copenhagen, Denmark

Filed Mar. 8, 1974, Ser. No. 449,563

Claims priority, application Denmark, Mar. 14, 1973, 1386/73

Int. Cl.² A47L 5/14

U.S. Cl. 15—331 **7 Claims**



1. In a vacuum cleaner comprising a motor-driven fan unit mounted in a casing having an unobstructed discharge aperture, internal duct means defining a first air flow passage connecting said discharge aperture with the outlet of said fan unit, and a flow restriction in said first air flow passage intermediate the ends thereof, the improvement comprising the provision of at least one primary air inlet aperture in an outer-wall of said casing spaced from said discharge aperture and at least one secondary aperture in a wall of said internal duct means, which primary and secondary apertures communicate by way of a second air flow passage extending through the interior of said casing, said secondary aperture being provided downstream of said flow restriction in an area of said wall, which is obstructed by a hose coupling associated with the vacuum cleaner, when said hose coupling is inserted in said discharge aperture.

3,943,598

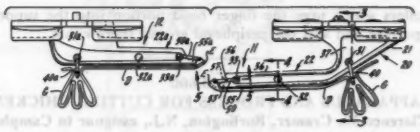
ARM CONSTRUCTION FOR DRAPERY MASTER SLIDE

William Van Buren Fielder, Jr., Westminster, Md., assignor to Roper Corporation, Kankakee, Ill.

Filed Sept. 16, 1974, Ser. No. 506,743

Int. Cl.² A47H 15/00

U.S. Cl. 16—93 D **5 Claims**



1. In a master slide for use on a slotted drapery rod and for use with drapery hooks of inverted U-shape having a front leg and a rear leg, the combination comprising a slide body having means for registering with the slot in a rod and for holding the body in upright position on the rod, a bracket having a base portion and supporting arm, the bracket being secured to the slide body with the arm projecting horizontally, the bracket having a vertically extending first hole spaced substantially inwardly from the tip of the arm for receiving the rear leg of a first drapery hook, abutment means on the bracket in the path of vertical swinging movement of one of the legs of a hook for maintaining the first hook upright in a forwardly projecting direction, the arm having a vertically extending second hole in its tip for receiving the rear leg of a second drapery hook with such hook in laterally extending position, abutment means on the tip of the arm in the path of vertical swinging movement of one of the legs of the second drapery hook for maintaining the second hook upright, and an auxiliary abutment at the tip of the arm in the path of forward swiveling movement of the second hook so that the second hook is positively held in a position projecting laterally from the tip at substantially right angles to the first hook and so that when the leading edge portion of a drape is hooked in stretched condition between the hooks it closely conforms to the front surface of the arm to a point extending beyond the tip of the arm.

3,943,599

METHOD AND APPARATUS FOR SEATING POULTRY FEATHER PLUCKING FINGERS

Haskell J. Norwood, Geraldine, Ala., assignor to Gainesville Machine Company, Inc., Gainesville, Ga.

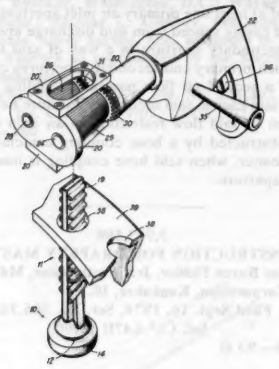
Filed Apr. 17, 1974, Ser. No. 461,702

Int. Cl.² A22C 21/00

U.S. Cl. 17—1 R **4 Claims**

1. A method of mounting a resilient poultry feather plucking finger to a rigid finger support with a peripheral groove in a head portion of the finger seated snugly within an aperture in the finger support and with an elongation portion of the finger projecting outwardly from the finger support aperture, said method comprising the steps of passing at least part of the

elongation portion of the finger through the finger support aperture and through a pair of spaced counterrotating drive



rollers which urge the finger head portion into the support aperture and seat the peripheral groove therewithin.

3,943,600

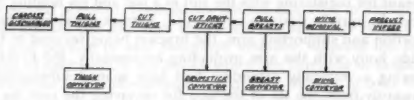
APPARATUS AND PROCESS FOR CUTTING CHICKEN

Clarence W. Cramer, Burlington, N.J., assignor to Campbell Soup Company, Camden, N.J.

Filed May 6, 1974, Ser. No. 467,002

Int. Cl.[2] A22C *21/00*

U.S. Cl. 17—11 **30 Claims**



23. In apparatus for separating chicken into its components such as wings, legs, thighs and breasts including conveying means for conveying the chicken along a predetermined path, the improvements comprising: wing-cutting means to cut the wings off of the chicken carcass at the wing joints, said wing-cutting means including a pair of rotatable wing-cutting blades at opposite sides of said predetermined path, means mounting said cutting blades for movement toward and away from said predetermined path and means responsive to the chicken carcass reaching a predetermined position along said predetermined path for causing said cutting blades to move toward the chicken carcass to cut the chicken carcass at the wing joints as a chicken moves along said predetermined path past said wing-cutting means.

3,943,601

MOLDABLE FOOD DEPOSITING APPARATUS

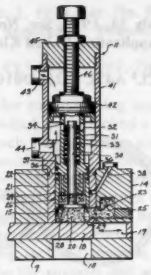
Harvey G. Kuhlman, 21466 Silver Spring Road, Menomonee Falls, Wis. 53051

Continuation-in-part of Ser. No. 32,029, April 27, 1970, Pat. No. 3,725,974. This application Apr. 10, 1973, Ser. No. 349,777

Int. Cl.[2] A22C *7/00*

U.S. Cl. 17—32 **13 Claims**

1. A food depositing apparatus to apply predetermined amounts of food patties to a base, comprising conveying means for supporting said base, a mechanical forming means to preform at least one pattie, and a fluid means having an output fluid stream selectively impressed after the forming of the pattie upon the one face of the preformed pattie and thereby positively forcing the pattie from said mechanical forming means and onto said base, said forming means includes a metering plate having an opening corresponding to the pattie, and valve means coupled to selectively apply said fluid stream upon the top side of the pattie.



3,943,602

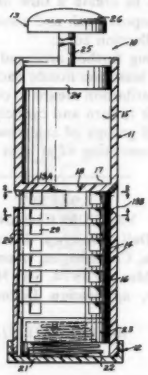
PATTY MAKER

Anthony Siclari, 1261 E. 57th St., Brooklyn, N.Y. 11234

Filed Oct. 17, 1973, Ser. No. 407,310

Int. Cl.[2] A22C *7/00*

U.S. Cl. 17—32 **4 Claims**



1. A patty maker for making hamburger or other food mix patties having a food mix extrusion and a mold-filling means, comprising:

a cylinder, divided into an upper chamber for holding food mix,

a lower chamber for holding stacked patty molds by a dividing partition between said chambers,

the partition having an opening therethrough for communication of food mix to the adjacent of said patty molds,

said lower chamber, holding said stacked molds, said lower chamber closed at the bottom by a cover having attached thereto a coiled compression spring,

said lower chamber at the top having a tapered opening for passage therethrough of a finger tip for the purpose of ejecting said patty molds lateral to the cylinder axis,

said lower part of the cylinder having a keyway,

each of said patty molds having a key for non-rotational axial-sliding fit of said patty molds in said keyway,

said spring attached to said lower cover biasing said patty molds upward towards the opening in said partition,

said patty molds each provided with circumferentially disposed exterior slots tapering inward from the exterior surface and upward to the top of the mold,

said lower part of the cylinder on the interior wall fitted correspondingly in radial alignment with said tapered slots with inward biased flat springs for the purpose of locking the topmost of said molds against downward movement when applying extrusion pressure to the food mix,

said coil spring overcoming said flat springs by forcing the stacked molds upwardly so that the stacked molds are automatically moved up and locked into place each time the uppermost mold is removed,

said keyway serving the purpose of aligning said patty mold so that said flat springs will always meet said tapered recesses as each mold comes up,

means of applying extrusion pressure comprising a piston slidably, but removably, fitted into the upper of said chamber and connected by a shaft to a member suited for the application of pressure by the palm of the hand.

3,943,603

APPARATUS FOR ALIGNING THE TAIL PARTS OF FISH

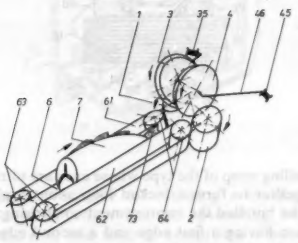
Franz Hartmann, Bad Oldesloe, Germany, assignor to Nordischer Maschinenbau Rud. Baader, Lubeck, Germany

Filed Apr. 17, 1974, Ser. No. 461,609

Claims priority, application Germany, Apr. 19, 1973, 2319923

Int. Cl.² A22B *5/08*

U.S. Cl. 17—53 **8 Claims**



1. Apparatus for aligning fish comprising first and second wheel assemblies each comprising a pair of spaced rotors having radially-extending impellers, the impellers of the pair of rotors of the first wheel assembly being arranged to move in between the impellers of the respective pair of rotors of the second wheel assembly during rotation of said rotors, the impellers of the rotors in each pair being spaced from each other to define a space through which fish are conveyed when engaged by the rotating impellers, the impellers of at least one of said assemblies being relatively movable towards and away from the other assembly to vary the cross-section of said space to conform to the cross-section of the fish passing therethrough.

3,943,604

ABRASIVE SEED DEFIBERIZATION

Cecil F. Harrington, Corinth, Miss.; James M. Johnson, and Howard T. Prince, both of Memphis, Tenn., assignors to The Procter and Gamble Company, Cincinnati, Ohio

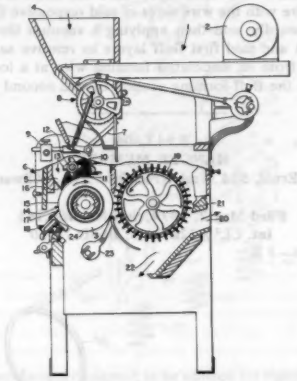
Filed Oct. 21, 1974, Ser. No. 516,514

Int. Cl.² D01B *1/06*

U.S. Cl. 19—43 **3 Claims**

1. In a seed delinter comprising a seed bin comprising a seed roll seal strip and a seed seal strip, means for regulating a supply of lint bearing seeds in said bin, a defiberizing cylinder having a delinting face on a radially outwardly facing cylindrical surface, means for agitating said supply and for confining seeds in contact with said delinting face, and means for rotating said cylinder so that said delinting face moves sufficiently fast relative to said seeds to substantially delint said seeds, the improvement wherein:

said delinting face comprises an open pattern of unpiled abrasive particles which particles are adhered in spaced relation to said radially outwardly facing cylindrical surface of said defiberizing cylinder, said open pattern comprising from about forty to about eighty said abrasive



particles per square inch to the seed contacting surface, which abrasive grit particles are in the size range of U.S. Sieve Series numbers of from about twelve to about forty;

said seed roll seal strip is disposed in non-contacting relation with said delinting face and is spaced sufficiently close to said delinting face to substantially obviate seeds passing therebetween; and

said seed seal strip is spaced sufficiently close to said delinting face to substantially obviate the passage of lint bearing seeds therebetween yet is spaced sufficiently far from said face to freely pass substantially delinted seeds therebetween.

3,943,605

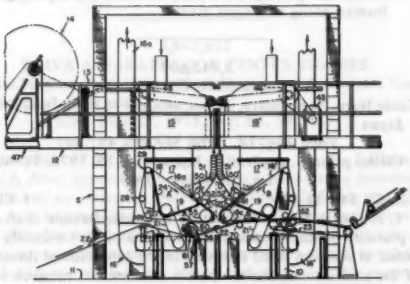
FLUFF ARTICLE AND METHOD AND APPARATUS FOR FORMING SAME

Ernst Daniel Nystrand, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed May 16, 1974, Ser. No. 470,535

Int. Cl.² D01G *13/00*

U.S. Cl. 19—145 **4 Claims**



1. In a method of forming fluff for an absorbent product, the steps of simultaneously advancing first and second continuous

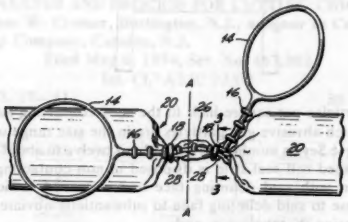
wires respectively along first and second paths, each path providing a fluff-forming section therealong, said fluff-forming sections being inclined relative to the horizontal; depositing fluff downwardly onto the top of each of said wires adjacent said fluff-forming sections while creating a vacuum beneath said wires adjacent said fluff-forming section, thereby to form first and second continuous layers of fluff respectively on the top of said first and second wires; removing said first layer of fluff from said first wire and continuously depositing it on an advancing wrap sheet with the wire side of said first fluff layer contacting said wrap sheet; then bringing said first fluff layer adjacent said second fluff layer while the latter is still on its forming wire with the wire sides of said respective fluff layers facing outwardly; and then applying a vacuum through said wrap sheet and said first fluff layers to remove said second fluff layer from its associated forming wire at a location remote from the fluff-forming section of said second wire.

3,943,606

HANGER MEMBER

Donald J. Ernst, 524 West Greenfield Ave., Milwaukee, Wis. 53204

Filed May 2, 1974, Ser. No. 466,161
Int. Cl.² A22B *1/00*; B65D *77/10*
U.S. Cl. 24—3 R **3 Claims**



1. A flexible hanger member adapted to be attached by clip means to a casing for a plurality of link type product to permit hanging thereof during processing operation, the member comprising:

resilient stem means adapated to receive the clip means for attaching said member to the casing;

resilient loop means positioned generally adjacent each end of said stem means to facilitate hanging the product from either of said loop means; and

anchorage means positioned on said stem means generally intermediate said loop means to prevent slippage along and detachment of said stem means from the casing and clip means once it is fastened thereto, said anchorage means comprising a plurality of spaced nubs integrally formed along said stem means.

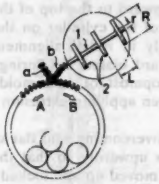
3,943,607

PLASTIC BINDER

Kunio Hara, Sagamihara, Japan, assignor to Nifco Inc., Tokyo, Japan

Filed Aug. 14, 1974, Ser. No. 497,407
Claims priority, application Japan, Aug. 15, 1973, 48-90823
Int. Cl.² B65D *63/00*
U.S. Cl. 24—16 PB **1 Claim**

1. A plastic binder comprising a slender flexible shaft and a plurality of disc-shaped flanges substantially co-axially disposed at uniform fixed intervals in the longitudinal direction of the said slender shaft, wherein the interval between each pair of adjacent flanges is substantially thirty percent smaller than the diameter of the flanges and said shaft and an adjacent pair of disc-shaped flanges located at one end of said binder can be angularly disposed to accept a pair of angularly disposed disc-shaped flanges and the joining part of said shaft



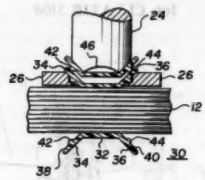
located at a substantial distance along said binder when said binder is bent into an encircling confronting position.

3,943,608

BUNDLING STRAP

Paul Farkas, Hackensack, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Jan. 8, 1975, Ser. No. 539,517
Int. Cl.² B65D *63/00*
U.S. Cl. 24—16 PB **10 Claims**



1. A bundling strap of the type whose ends are ultrasonically welded together to form a locked loop about a plurality of articles to be bundled the improvement comprising: a central body portion having a first edge and a second edge; at least one marginal strip coupled to one of said first and second edges; said marginal strip having an interior surface and an exterior surface, said exterior surface being positioned adjacent articles to be bundled; at least one energy directing means, one for each marginal strip and coupled to its associated marginal strip; said energy directing means contacting said marginal strip when a portion of said strip overlies a further portion of said strap after same has been looped about a plurality of articles to be bundled; said energy directing means forming a joint with said overlying marginal strip when said strap is subjected to ultrasonic welding energy.

3,943,609

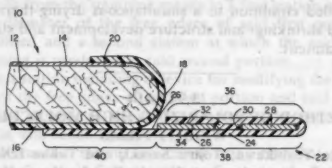
ADHESIVE DIAPER FASTENER WITH INTEGRAL ADHESIVE PROTECTING MEANS

Francis L. Egan, Jr., Arlington Heights, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,089
Int. Cl.² A41B *13/02*; B32B *3/04*
U.S. Cl. 24—73 VA **3 Claims**

1. A diaper fastener comprising an elongated strip of tape having an adhesive coated surface and a web adhesively secured to and remaining affixed to said surface in the longitudinally central portion of said strip of tape, the exposed surface of said web having limited affinity for said adhesive, said adhesive coated surface in one end portion of said strip of tape

in contact with said web exposed surface, said web having an opening therethrough whereby regions of adhesive in said end



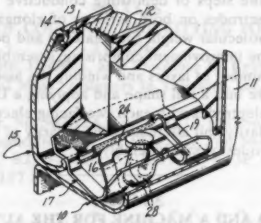
and central portions aligned with said opening are in contact for releasably securing said end portion.

3,943,610

ADAPTER FOR ATTACHING MOLDING OR THE LIKE

Engelbert A. Meyer, Bloomfield Hills, Mich., assignor to USM Corporation, Boston, Mass.

Filed Oct. 3, 1974, Ser. No. 511,505
Int. Cl.² A44B *21/00*; E04F *19/02*
U.S. Cl. 24—73 HS **3 Claims**



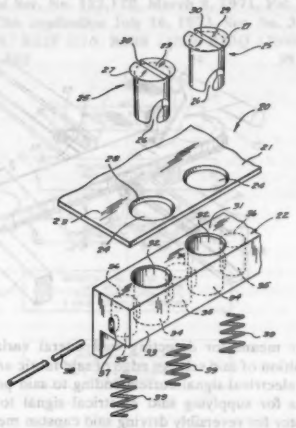
1. An adapter suitable for retaining a molding member adjacent a panel which has an upstanding headed stud mounted thereon, said adapter comprising a pair of spaced legs terminating at one of their ends in a connecting flange having means for retaining said molding member, an upturned flange connecting the opposite ends of said legs, an inclined ramp portion connected to the opposite ends of said legs at said upturned flange and extending between said legs toward said connecting flange, said inclined ramp having an opening formed thereon, which opening extends into a portion of said upturned flange, a unidirectional linear guide surface defining said opening in said ramp and extending from said upturned flange toward said connecting flange, said guide surface terminating at a notched portion forming said opening, a torsionally resilient arm extending into said ramp opening cantilevered adjacent the lower portion of said upturned flange, said arm having a camming surface forming an angle with said guide surface and disposed in spaced relation with said guide surface, and further having a pressure surface forming an angle of substantially 45° with said guide surface whereby during movement of said adapter to cause said headed stud to enter said opening with said head overlying said ramp said stud is forced into contact with said guide surface by said camming surface and said arm is torsionally moved to provide space between said guide surface and said arm to permit entry of said stud into said ramp opening along a path parallel to said linear guide surface, and said pressure surface contacting said stud under said stud head to retain said stud positioned adjacent said notched portion in said ramp opening.

3,943,611

FLUSH HEAD PANEL FASTENER

Peter Schenk, West Islip, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Continuation of Ser. No. 444,333, Feb. 21, 1974, Pat. No. 3,861,004. This application Oct. 16, 1974, Ser. No. 515,308
Int. Cl.² A44B *21/00*
U.S. Cl. 24—203 R **7 Claims**



1. A panel fastener adapted to be utilized for rigidly interengaging two members so that the resultant assembly contains a substantially flush exposed surface comprising:

a receptacle portion with a row of cups therein with every other cup adapted to receive a stud element therein;

a longitudinal pin shiftably mounted on the receptacle portion and extending through the cups;

a biasing element in each cup not adapted to receive a stud element and being retained in position by engagement with the pin;

a stud element having a cam slot for releasable engagement with the pin; and

the stud element and receptacle adapted to receive two members to be fastened therebetween and to engage therewith so that when the stud element is engaged with the receptacle portion and two members are positioned therebetween, the stud element will be extendable entirely within the members from one side thereof with substantially no portion thereof extending above the exposed surface of the members so as to provide an exposed flush surface and the stud element being rotatable between an open and a closed position so that when the stud is rotated to the closed position, the pin will follow the cam slot and will bias the biasing element in each adjacent cup to retain the pin in closed position.

3,943,612

DRIVE APPARATUS FOR TENTER FRAMES

James W. Campbell, Greenville, S.C., assignor to Barbara Cox Campbell, Greenville, S.C.

Filed June 27, 1975, Ser. No. 591,057
Int. Cl.² D06C *3/02*
U.S. Cl. 26—57 E **7 Claims**

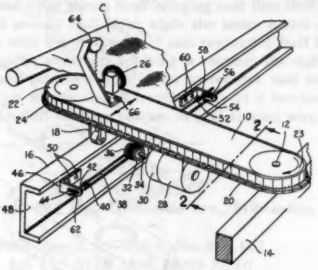
1. A drive apparatus for accurately positioning a movable lead-in rail member on a tenter frame for textile fabric and the like, said rail member pivotably attached at one end thereof and slideably supported at an opposite end thereof on a transverse support member, an endless traveling chain member carried by said rail member having fastening means for receiving and engaging a selvage of said fabric to move the fabric along the tenter frame rail member, and said drive apparatus

pivoting said rail member about the pivot axis thereof in response to lateral variations in the position of the selvage edge of said fabric as said fabric is fed onto said fastening means of said traveling chain member, said drive apparatus comprising:

a reversible driving motor carried by said rail member;

a capstan member rotatably driven by said driving motor;

a cable member looped around said capstan member having a first end fixed on one side of said rail member and a second end fixed on the opposite side of said rail member;



sensor means for detecting said lateral variations in the position of said selvage edge of said fabric and generating an electrical signal corresponding to said position; and

means for supplying said electrical signal to said driving motor for reversibly driving said capstan member pulling said rail member back and forth along said cable member to follow the lateral position of said selvage edge;

whereby the selvage of said fabric is properly and uniformly aligned on said fastening means carried by said endless traveling chain member.

3,943,613

PROCESS FOR THE SHRINKING AND STRUCTURE DEVELOPMENTS OF TEXTILE WEBS AND THE LIKE

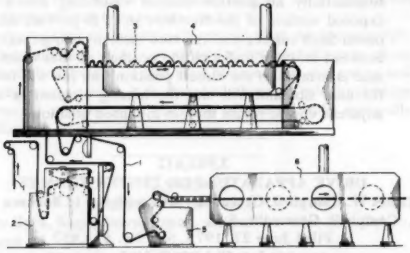
Alfred Schraud, Op de Bult, 2092 Moschen, and Karl-Heinz Gottschalk, Schulenburgring 50, 2 Hamburg 80, both of Germany

Filed May 17, 1974, Ser. No. 471,099

Claims priority, application Germany, May 18, 1973, 2325215

Int. Cl.² D06B 3/02, 3/06

U.S. Cl. 28—76 R **2 Claims**



1. Process for the shrinking and structure development of textile webs, particularly knitted goods or webs of textured synthetic yarns and the like, comprising the steps of:

a. subjecting the textile web, under tension-free, and especially lateral-tension-free guidance to a combined washing or cleaning and wet-shrinking and structure development treatment;

b. then subjecting the textile web to a simultaneous steam- and drying-shrinking and structure development while guiding the tension-free or lateral-tension-free textile web to a point of complete dryness by drying with clean superheated steam or a superheated steam-air mixture having a steam content of at least about 75% by volume; and

c. finally subjecting said web in flat-spread or spreadcontrolled condition to a simultaneous drying-thermofixing and shrinking- and structure development and stabilizing treatment.

3,943,614

METHOD OF POLARIZING HIGH MOLECULAR WEIGHT FILMS

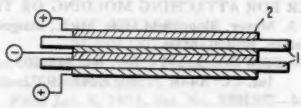
Shinsuke Yoshikawa; Tohru Sasaki, and Takao Ichii, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 17, 1974, Ser. No. 489,326

Claims priority, application Japan, July 17, 1973, 48-79816

Int. Cl.² H01L 41/22

U.S. Cl. 29—25.35 **5 Claims**



1. In a method of polarizing high molecular weight films comprising the steps of depositing conductive thin films as opposing electrodes on both surfaces of elongated strips of polar high molecular weight film material and polarizing said film strips, the improvement comprising: assembling the strips in an even number of layers and winding the assembled strips around a core into a roll shape and applying a D.C. potential across said electrodes with each two facing electrodes having the same polarity and alternating the polarity of the groups of facing electrodes of said assembly.

3,943,615

METHOD AND A MACHINE FOR THE AUTOMATIC MANUFACTURE OF PRESSURIZED OR LIQUEFIED GAS TANKS

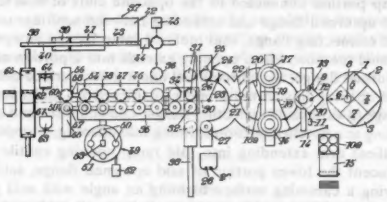
Paul Nee, Dange-Saint-Romain, France, assignor to Roger Pelleray, Paris, France

Filed Apr. 1, 1974, Ser. No. 457,216

Claims priority, application France, Apr. 9, 1973, 73.12705

Int. Cl.² B21D 51/00

U.S. Cl. 29—33 P **12 Claims**



1. A machine for the manufacture of substantially cylindrical fluid containers from metal sheets, said containers including a base support and an upper opening adapted to receive an adaptation element for a valve, said machine comprising:

means for producing, by stamping from a first and a second piece of sheet metal, respectively, substantially identical blanks of a first portion and a second portion of each container such that the said substantially identical blanks each have the shape of a cylinder open at one end, whereof the free edges substantially form a cross-section

of the said cylinder, the said first portion serving as the lower portion of the said container, and the second portion serving as the upper portion of the said container,

first transfer means for alternatively transporting the said blanks from the stamping means to a first station at which the diameter of the free edges of said first portion is modified and a second station at which the said upper opening is produced in said second portion,

said first station including a device for modifying the diameter of the free edges of said first portion and said second station including a device for producing the upper opening in said second portion,

second transfer means for transporting the first portion blanks from said first station to a first side of a first transport belt and the second portion blanks from said second station to a second side of said transport belt,

a device located on the first side of the transport belt for arranging the base supports on the blanks of said first portion,

a device located on the second side of the transport belt for arranging the adaptation element on the second portion blanks,

third transfer means for discharging said first and second portions from the transport belt and for bringing said portions, by pairs, to an assembling station, and

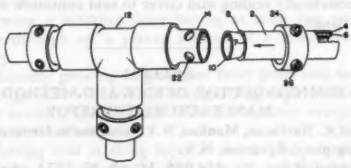
means at said assembly station for assembling, by welding, the said free edges of the open ends of the first and second portion of the container.

3,943,616

METHOD OF COUPLING, AND FITTING FOR, LINED TUBING

Verity C. Smith, Dedham, and Lawrence H. Reynolds, Needham, both of Mass., assignors to Vaponics, Inc., Plymouth, Mass.

Division of Ser. No. 307,124, Nov. 6, 1972, Pat. No. 3,888,519. This application Apr. 3, 1975, Ser. No. 564,859
Int. Cl.² B21D *53/00*; B21K *29/00*; B23P *15/26*
U.S. Cl. 29—157 R **9 Claims**



1. Process for forming a joint between a coupling member and a conduit, both having an inner lining formed of non-contaminating material and an outer jacket formed of a material dissimilar to said non-contaminating material, said dissimilar material being chosen to provide structural support, said process being characterized by the steps of:

providing said coupling member with a female receptacle having an inner surface and an inner shoulder, both formed of non-contaminating material;

removing a cylindrical segment of said outer jacket of said conduit to expose an end portion of said inner lining;

slipping an O-ring of non-contaminating material over the exposed portion of said inner lining;

inserting the exposed portion of said conduit into the female receptacle to a sufficient depth to contact the exposed portion with the shoulder and to contact a portion of said conduit's outer jacket with said coupling member; and

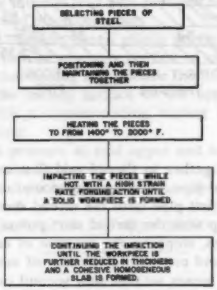
securing said outer jacket of said conduit to said outer jacket of said coupling member to provide a load path between said jackets of said coupling member and conduit, whereby the O-ring forms a seal between the inner lining of said coupling member and conduit to prevent fluid from contacting said jackets.

3,943,617

NOVEL APPARATUS AND SOLID STATE METHOD FOR CONVERTING SMALL PIECES OF METAL TO A WORKPIECE

Mark E. Whalen, Pepper Pike; Norman W. Trepanier, Rocky River; Robert A. Kraus, Shaker Heights, and Joseph W. Malleck, Chagrin Falls, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Division of Ser. No. 122,110, March 8, 1971, Pat. No. 3,768,139. This application July 16, 1973, Ser. No. 379,781
Int. Cl.² B22F *3/16*; B30B *13/00*; B23Q *17/00*
U.S. Cl. 29—403 **39 Claims**


SELECTING PIECES OF STEEL
POSITIONING AND THEN MAINTAINING THE PIECES TOGETHER
HEATING THE PIECES TO FROM 1400° TO 3000° F.
IMPACTING THE PIECES WHILE HOT WITH A HIGH STRAIN RATE FORGING ACTION UNTIL A SOLID WORKPIECE IS FORMED
CONTINUING THE IMPACTION UNTIL THE WORKPIECE IS FURTHER REDUCED IN THICKNESS AND A COHESIVE HOMOGENEOUS SLAB IS FORMED

1. The method of treating a bale of selected steel scrap to convert the scrap to a solid mass of steel usable in a manufacturingg operation, comprising the steps of:

a. heating the bale in a furnace while maintaining the bale constituents in a solid state, at least a portion of the heating being conducted in a controlled environment to control chemical reactions involving the bale constituents;

b. impacting surfaces of the bale with a pair of opposed platens;

c. limiting lateral dissipation of the impaction forces by constraining other surfaces of the bale to prevent lateral movement of the bale constituents beyond such constraint;

d. said impacting of the bale being at a sufficiently greate angular velocity to cause molecular migration among pieces of scrap in the bale while the inertia of rest of the bale constituents and the mechanical interconnection of the bale constituents inhibit longitudinal dissipation of the impaction forces such that bale elongation occurs primarily due to compaction of the bale to a substantially solid body; and,

e. thereafter continuing the impaction of the body until the body is a solid mass of steel in which the surfaces of the constituents have been welded to one another by molecular migration resulting from such impaction.

3,943,618

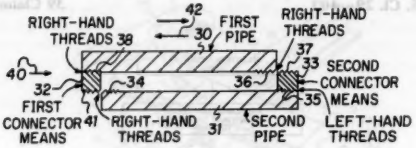
METHOD OF ASSEMBLY OF A DUAL-WALLED PIPE

Thomas K. Perkins, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 30, 1974, Ser. No. 537,355
Int. Cl.² B23Q *17/00*
U.S. Cl. 29—407 **3 Claims**

1. A method for making a double-walled pipe assembly for use in a permafrost zone in a wellbore comprising providing two sections of pipe which fit together concentrically to provide an annulus therebetween, the inside pipe being threaded at both ends on its outside wall, the outside pipe being threaded at both ends on its inside wall, providing first and second annular connecting means which are threaded on their inner and outer walls, threading the first connecting means

onto a first of said pipes, threading the second connecting means onto the second pipe, said second pipe having threads of opposite rotational directions at either end so that when said first pipe and said first connector means are assembled with said second pipe said second connector means can be rotated relative to said first pipe thereby moving said second connector means longitudinally toward or away from said first pipe and lining up thread start points on said second connector means and first pipe, rotating said first pipe and first connector means together to thread said first connector means onto said second pipe, rotating said second connector means relative to said first pipe until the thread start points on said first pipe line up with the thread start points on said second connector means, stopping the rotation of said second connector means, and continuing rotation of said first pipe and first connector means so that said second connector means threads onto said first pipe at the same time said first pipe threads onto said second connector means.

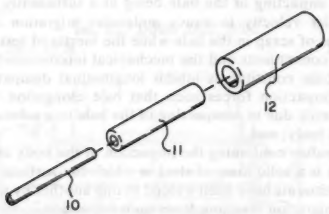


3,943,619

PROCEDURE FOR FORMING SMALL WIRES

Paul E. Hendrickson, Wayne, Pa., assignor to Raymond Boyd Associates, Broomall, Pa.

Filed Oct. 2, 1974, Ser. No. 511,354
Int. Cl.² B23P 17/00
U.S. Cl. 29—423 2 Claims



1. In the method of forming ultrafine wires of a given material including the steps of forming a core wire of a given material, encasing the core wire within an elongate sheath of drawable sacrificial material, successively drawing the sheath to a predetermined reduced cross section to proportionately reduce the core wire and thereafter remove the sheath material by sacrificial methods leaving the proportionately reduced core wire, the improvements in forming a sheath to provide increased sheath to core wire ratios resulting in greater core wire reductions comprising:

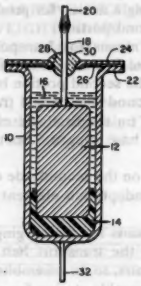
telescoping a plurality of elongate sheaths one within another to form an overall sheath having an inside and outside diameter required to establish the desired reduction ratio.

3,943,620

METHOD OF FORMING A HERMETIC ENCLOSURE

Peter Sawchuk, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 447,493, March 4, 1974, Pat. No. 3,912,985. This application June 9, 1975, Ser. No. 584,879
Int. Cl.² B01J 17/00
U.S. Cl. 29—570 5 Claims



1. A method of forming an enclosure comprising the steps of

providing a silver container open at one end,

forming from said container material a unitary outwardly protruding flange at the open end of said container,

providing a metallic cover substantially coextensive with said flange,

adhering a layer of material selected from the group consisting of gold and gold alloy to at least one surface of said cover,

at least one surface of said cover, disposing said cover over said open end of said container with said layer adjacent said flange, and

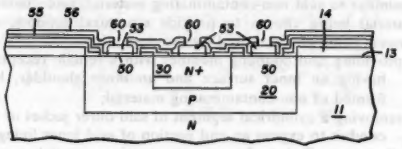
hermetically sealing said cover to said container along said flange.

3,943,621

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURE THEREFOR

David K. Hartman, Manlius, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Division of Ser. No. 454,095, March 25, 1974, abandoned. This application Mar. 10, 1975, Ser. No. 556,645
Int. Cl.² B01J 17/00
U.S. Cl. 29—578 2 Claims



1. A method of manufacture for a semiconductor device comprising the steps of:

diffusing impurities into a silicon semiconductor chip through photolithographic techniques, wherein said diffusing step leaves said chip coated with silicon dioxide;

forming contact windows in said silicon dioxide so as to expose the underlying silicon at selected areas;

coating said silicon dioxide and the peripheral portions of said selected areas with a barrier layer of pyrolytic silicon nitride;

forming platinum silicide on the remaining exposed portions of said silicon and forming metallic electrical contacts on the platinum silicide;

forming a layer of low-temperature silicon dioxide on said silicon nitride and said contacts;

depositing a layer of glass on said layer of low-temperature silicon dioxide, said glass being deposited by the substeps of:

depositing a first layer of particulate glass and applying heat to cause fusion; and

depositing a second layer of particulate glass and applying heat to cause fusion; and

forming openings in said glass and said low temperature silicon oxide to provide access to said contacts.

3,943,622

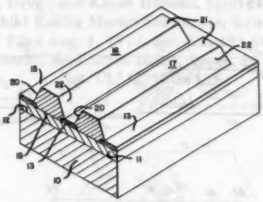
APPLICATION OF FACET-GROWTH TO SELF-ALIGNED SHOTTKY BARRIER GATE FIELD EFFECT TRANSISTORS

He B. Kim, Murrysville, and Michael C. Driver, Trafford, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 317,992, Dec. 26, 1972, Pat. No. 3,855,690. This application Oct. 22, 1974, Ser. No. 517,284

Int. Cl.² H01L *21/205, 21/28, 29/48*

U.S. Cl. 29—579 1 Claim



1. A method for making a semiconductor device comprising the steps of:

a. forming a masking layer having at least one window therethrough on a planar surface of a semiconductor body;

b. epitaxially growing at least one facet from said surface through said window and overgrowing edge portions of said masking layer at said windows to form overgrowth portions on the facet;

c. removing said masking layer to cause said overgrowth portions of said facet to overhang portions of the surface adjoining the facet and shield said portions of the surface against metal deposition; and

d. depositing metal on unshielded portions of the surface spaced from the facet to form a contact to the surface.

3,943,623

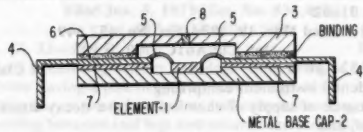
HOLLOW CAVITY PACKAGE ELECTRONIC UNIT

Kazunori Mizutani; Toshihiko Kitaura, and Minoru Noo, all of Ibaragi, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaragi, Japan

Filed Aug. 23, 1974, Ser. No. 499,955

Int. Cl.² B01J *17/00*

U.S. Cl. 29—588 2 Claims



1. A method of fabricating a package for housing an electronic unit in a cavity within said package comprising the steps of: :

a. mounting said electronic unit on a lower portion of said package;

b. applying a fibrous sheet, selected from the group consisting of non-woven polyester fabric, glass paper and Japanese wooden paper, impregnated with a partially cured plastic polymer to a mating surface of the lower portion, said plastic polymer being selected from the group consisting of epoxide resin polymers, unsaturated polyester resin polymers, pheral resin polymers and melamine resin polymers;

c. placing the externallead wires onto the fibrous sheet so as to bond them to the lower portion;

d. connecting internal lead wire between said external lead wires and said electronic unit;

e. applying a partially cured plastic polymer adhesive to a mating surface of an upper portion of said package, said upper portion having an aperture therein;

f. bringing the mating surface of the upper portion into contact with a corresponding mating surface on said lower portion;

g. applying a pressure to said upper and lower portions so as to maintain their contact;

h. heating said package to fully cure the plastic polymer adhesive; and

i. sealing said aperture in said upper portion of the package.

3,943,624

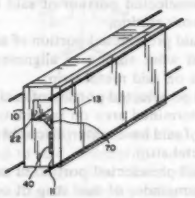
METHOD OF MANUFACTURING A MAGNETIC HEAD

Larry Wank, Hunter, N.Y., assignor to U. S. Philips Corporation, New York, N.Y.

Filed Jan. 24, 1975, Ser. No. 543,765

Int. Cl.² G11B *5/42*

U.S. Cl. 29—603 9 Claims



1. A method for manufacturing a magnetic head having at least one pole tip pair, the tips of each pair being separated by a non-magnetic gap of a desired length, the steps comprising:

forming a generally planar gap side surface in each of said pole tips;

forming an elongated apex forming channel in one of said pole tips, said apex forming channel communicating with said generally planar gap side surface of said tip;

forming an elongated reservoir channel in one of said tips; said reservoir channel being in communication with said generally planar surface of said tip in which it is disposed, said reservoir channel being disposed in generally parallel relationship to said apex channel;

melting a quantity of glass into said reservoir channel;

polishing said one tip having said reservoir channel therein until no glass extends out of said reservoir channel above said generally planar surface of said tip;

placing both of said pole tips with said generally planar faces thereof in opposed spaced relationship;

positioning a quantity of glass in said apex channel; and

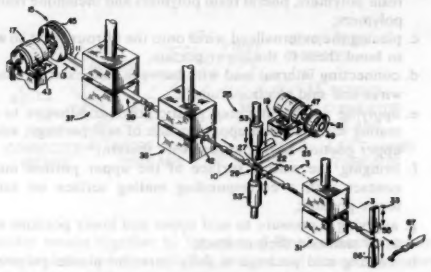
heating each of said tips and all of said glass until said glass in said reservoir channel and said apex channel flows into the space between said opposed generally planar surfaces of said tips to form a unitary assembly.

3,943,625

METHOD FOR MAKING TINED ELECTRICAL CONTACTS

Robert R. Brenan, Warren, Pa., and Gordon L. Johnson, Jamestown, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Division of Ser. No. 450,571, March 13, 1974. This application Jan. 17, 1975, Ser. No. 541,892
Int. Cl.² H01R 9/00
U.S. Cl. 29—630 C 7 Claims



1. A method for making tined electrical contacts from a continuous metal strip intermittently moving through a plurality of work stations, said method comprising:

advancing said metal strip in an established first direction of travel to a first of said work stations, said first direction occupying a first plane;

advancing a strip of contact material comprising a first layer of a base material and a second layer of a precious metal in an established second direction of travel to said first work station, said second direction of travel occupying a second plane substantially parallel to said first plane of travel of said metal strip;

defining a preselected portion of said contact material at said first work station;

positioning said preselected portion of said contact material at said first work station in alignment with a predetermined area on said metal strip;

securing said preselected portion of said contact material to said predetermined area on said metal strip by attaching said layer of said base material to said predetermined area on said metal strip;

separating said preselected portion of said contact material from the remainder of said strip of contact material;

advancing said metal strip having said preselected portion of said contact material secured thereto to a second of said work stations; and

cutting and forming said strip at said second work station to provide an electrical contact having at least one tine with a precious metal contacting area formed thereon.

3,943,626

PIPE CUTTER

Leonard H. Williams, 4100 N. Romera Road Space No. 112, Tucson, Ariz. 85705

Filed Jan. 23, 1975, Ser. No. 543,409
Int. Cl.² B23D 21/10; B26D 3/16
U.S. Cl. 30—100 5 Claims

1. A pipe cutter comprising

a. a chain pipe wrench including a chain,

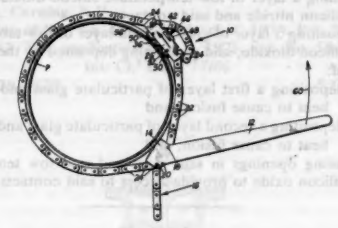
b. a lever handle having an eccentric pivot connected to said chain,

c. pipe engaging means on said lever handle arranged for gripping connection with a pipe in one direction of rotation of the lever handle,

d. a body member having top and bottom portions and opposite end portions,

e. means adjacent opposite end portions of said body member connected to spaced points on said chain,

f. and a cutter bit on said body member having a cutter end projecting beyond the bottom portion of said body member,



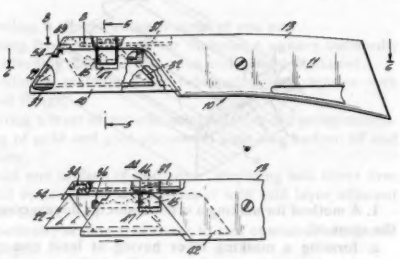
g. said cutter bit being arranged to cut a pipe upon reverse sliding movement of the chain around the pipe from that at which the lever handle has gripping connection on the pipe.

3,943,627

FRONT LOADING UTILITY KNIFE

Conrad Stanley, Jr., Wayne, N.J.

Filed Nov. 28, 1973, Ser. No. 419,637
Int. Cl.² B26B 5/00
U.S. Cl. 30—151 9 Claims



1. A front loading utility knife comprising an elongated hollow housing formed of complimentary first and second mating portions, an inwardly offset plate on each of the mating portions spaced from but parallel to the longitudinal center line of the housing forming an unobstructed front axial cavity therebetween, a cutting blade axially received within the cavity between the offset plates, means carried by at least one of the housing mating portions to limit the travel of the blade between the plates in a rearward direction only, latch means on the housing above the blade constituting the sole element limiting the travel of the blade in a forward direction, a guard slidably carried by the plates and slidable longitudinally for underlying the cutting edge of the blade and a guard positioning assembly for controlling the location of the guard with respect to the blade.

3,943,628

SPOON EXCAVATOR FOR APPLYING CHEMICALLY ACTING TOOTH DECAY ATTACKING FLUID

Joseph H. Kronman, 51 Algonquin Road, Canton, Mass. 02021, and Melvin Goldman, 8 Herbert Road, Worcester, Mass. 01602

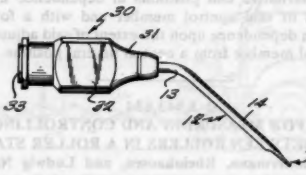
Filed Mar. 19, 1974, Ser. No. 452,649
Int. Cl.² A61C 3/00
U.S. Cl. 32—40 R 12 Claims

1. A dental instrument comprising

a. a source of supply of chemically active decay attacking fluid, and

b. means for administering said fluid from said source of supply to dental caries, assisting in providing access to

said caries by said fluid, and excavating said caries while not interfering with flow of said fluid, said means including a tubular member for conducting fluid from said fluid supply having an open working end thereof formed as a



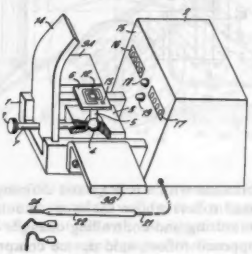
spoon excavator, having side surfaces outwardly diverging from the contour of said tubular member, a generally curved terminating surface, a generally flat top surface, and a generally depressed bottom surface.

3,943,629

TRAINING MACHINE FOR INTRA-ORAL INSTRUMENTATION

Hiroshi Ueno; James W. Grenfell; Fred M. Sorenson, all of Portland, Oreg., and Kazuo Hozumi, Joyo, Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Aug. 1, 1974, Ser. No. 493,692
Claims priority, application Japan, Aug. 6, 1973, 48-88231
Int. Cl.² G09B *23/28*
U.S. Cl. 32—71 **20 Claims**



1. A training machine for intra-oral instrumentation for dental treatment, comprising a plate carrying an electrically conductive path on the surface thereof; an imitation dental instrument with an imitation dental tool detachably attached thereto, so that a trainee traces said conductive path with said tool; means for measuring the time during which said conductive path is being traced with said tool; and means for shielding said plate so that said plate is visible to said trainee only through a mirror.

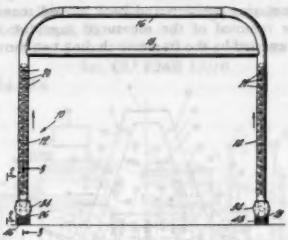
3,943,630

MEASURING WICKET FOR HEIGHT OF DOGS

George Hildebrand, Southbury, Conn., assignor to American Kennel Club, New York, N.Y.

Filed Jan. 3, 1975, Ser. No. 538,412
Int. Cl.² G01B *5/00, 5/02*
U.S. Cl. 33—169 R **5 Claims**

1. A measuring wicket for dogs comprising a U-shaped member having a pair of spaced tubular legs and an interconnecting bar, a cross bar below said interconnecting bar and extending between said legs and secured thereto, a plurality of spaced openings in each of said legs, leg extensions slidably telescopically received in said legs, indexing grooves in said extensions co-operable with said openings to indicate the effective height of said cross bar, and locking means secured to each of said legs for engagement with the associated leg



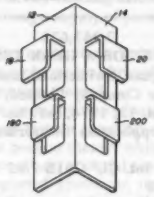
extension in said grooves for selectively locking each of said leg extensions in an adjusted position.

3,943,631

ADAPTER FOR INDICATING ON WALL PANELS AND THE LIKE THE LOCATION OF ELECTRICAL RECEPTACLE OR THE LIKE BOXES

Carl D. Smugor, 49 Park Ave., Middleport, N.Y. 14105

Filed Mar. 29, 1974, Ser. No. 456,000
Int. Cl.² B25H *7/04;* **G01B** *3/14*
U.S. Cl. 33—174 G **4 Claims**



1. An adapter for electrical receptacle boxes or the like, comprising;

a. at least one substantially planar member,

b. means attached to said member for removably securing said member on an edge of an electrical receptacle box,

c. said member having an end projecting from said means and outwardly from an electrical receptacle box when secured thereto,

d. means on said end for providing an indication of the location of said end with respect to an electrical receptacle box when secured thereto, and

e. said means attached to said member comprises two lips the main portions of which are parallel to and spaced different distances from said member.

3,943,632

APPARATUS FOR MEASURING THE LENGTH OF CURVILINEAR SEGMENTS

Gastone Albertazzi, Bologna, Italy, assignor to Finike Italiana Marposs, Soc. In Accomandita Semplice di Mario Possati & C., Bentivoglio, Italy

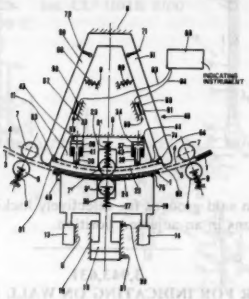
Filed Aug. 28, 1974, Ser. No. 501,338
Claims priority, application Italy, Sept. 4, 1973, 3488/73
Int. Cl.² G01B *7/00, 7/02*
U.S. Cl. 33—174 L **11 Claims**

1. An apparatus for measuring the length of curved segments, comprising:

a frame;

positioning means, carried by the frame, including: two shaped elements adapted to define a housing for the segment to be measured, said housing having a shape corresponding to the theoretical shape of the segment

and defining two openings for the passage of the ends of the segment; and means for successively displacing said shaped elements from a position for receiving a segment to a measuring position and back to said receiving position for removal of the measured segment; measuring means, carried by the frame, including two movable arms



with contact feelers for contacting, respectively, the ends of the segment projecting through said openings in said measuring position, located intermediate said arms; means for biasing the feelers towards the ends of the segment and transducer means for providing a signal responsive to the mutual distance of the feelers.

3,943,633

PROBE FOR A GEAR TESTER

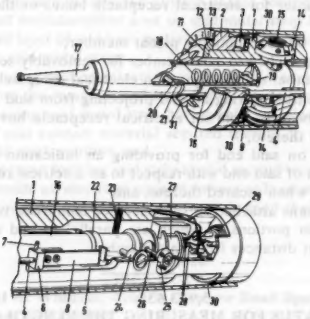
Heinz Ruffner, Langnau, Switzerland, assignor to Maag-Gear Wheel & Machine Company Limited, Zurich, Switzerland

Filed Sept. 13, 1974, Ser. No. 505,907

Claims priority, application Switzerland, Sept. 14, 1973, 13253/73

Int. Cl.² G01B 7/02

U.S. Cl. 33—179.5 R **8 Claims**



1. A feeler device comprising, in combination, an elongated probe element, a carrier for carrying said element, mounting means supporting said element on said carrier in a manner permitting relative movement between said probe element and said carrier, means for sensing said relative movement, said mounting means comprising a first spring means and a second spring means each extending parallel to the length of said probe element and acting on said probe in opposition to each other, a control member supported on said carrier and adjustable in either of two rotatable directions, a first connecting element and a second connecting element each extending parallel to the length of said probe element and disposed between said control member and said first and second spring means, respectively, whereby each of said first and second spring means is connected to said control member by a respective said connecting element, the adjustment of said control member on the carrier displacing said first and second connecting elements in opposite directions to each other in order to increase the biasing action of a selected one of said spring means on the probe element, said probe element being urged towards alternative end positions in dependence upon the adjustment of said control member and with a force that increases in dependence upon the extent of said adjustment of said control member from a central neutral position.

3,943,634

DEVICE FOR MEASURING AND CONTROLLING THE GAP BETWEEN ROLLERS IN A ROLLER STAND

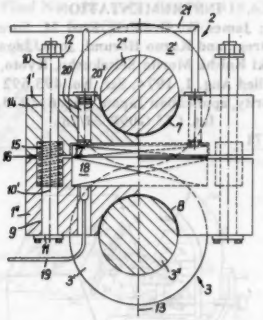
Herbert Lindermann, Rheinhausen, and Ludwig Niemeyer, Essen, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Dec. 2, 1974, Ser. No. 528,998

Claims priority, application Germany, Dec. 18, 1973, 2362805

Int. Cl.² B21B 37/08

U.S. Cl. 33—182 **8 Claims**



1. In combination with a roller stand defining the axes of a pair of opposed rollers whose shafts are mounted therein, a device for measuring and controlling changes in the gap between said opposed rollers, said device comprising first and second partial bearings engaging the sides of the shafts of the rollers which face each other, first and second measuring bridge parts, first and second measuring elements mounted on said bridge parts and connected to the respective partial bearings, preloaded spring means arranged between said first and second elements for biasing said partial bearing away from each other whereby said partial bearings and the respective said elements connected thereto will move relatively in conformity with relative movement of the rollers, and guide means guiding said bearing portions for relative movement in a direction parallel to a vertical plane of the axes of the rollers.

3,943,635

GUIDE LINE TRACER

Hiroshi Ito, Osaka, Japan, assignor to Sakai Chemical Industry Co. Ltd., Japan

Filed July 19, 1973, Ser. No. 380,548

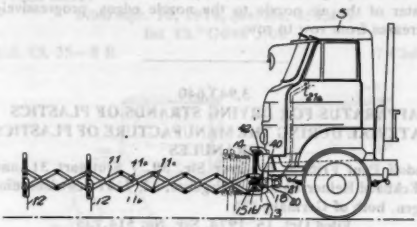
Claims priority, application Japan, July 26, 1972, 47-75655

Int. Cl.² G01C 15/00

U.S. Cl. 33—264 **9 Claims**

1. Road guide line marking apparatus including a vehicle comprising pantographic support means including a pair of ends extending longitudinally from said vehicle and formed of a plurality of pivotally articulated link members operable to enable selective longitudinal extension and contraction of said support means; means mounting one end of said pantographic

support means to said vehicle; indicator means mounted proximate the other end of said pantographic support means; and



driving means operable to effect selective longitudinal extension and contraction of said pantographic support means.

3,943,636

APPARATUS FOR DRYING GRAIN

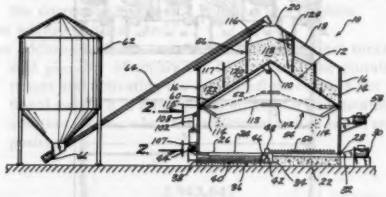
Vernon H. Sietmann; Larry S. Keese, and Raymond L. Smith, all of Laurel, Iowa 51041

Continuation-in-part of Ser. No. 364,955, May 29, 1973, Pat. No. 3,849,901. This application Mar. 8, 1974, Ser. No. 449,379

The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.

Int. Cl.² F26B *19/00*

U.S. Cl. 34—44 **4 Claims**



1. An apparatus for drying granular material in a grain bin having an enclosure forming wall, a roof mounted over the wall, and a base floor for the wall, the apparatus comprising:

a floor mounted in the upper part of the bin, said floor being inclined and sloping downwardly from the center of the bin toward and in contacting relation with the wall whereby granular material disposed on said floor is normally prevented from falling onto said base floor, said floor having a plurality of spaced apart openings formed therein adjacent said wall through which the granular material can fall,

a valve means positioned below each of said openings and being movable between open and closed positions to permit granular material to fall through said openings and to prevent granular material from falling through said openings respectively,

means for opening and closing said valve means including a motor having an output shaft, a counterweight operatively connected to said valve means, and a hydraulic torque convertor means operatively connecting said output shaft and said counterweight,

means for supplying drying air within the bin and below said floor,

a thermostat means on said floor for sensing the temperature of the granular material thereon,

said thermostat means being operatively connected to said means for opening and closing said valve means so that said valve means will be opened when said thermostat means senses a first predetermined temperature and so that said valve means will be closed when said thermostat means senses a second predetermined temperature.

3,943,637

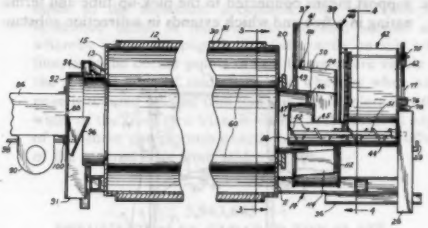
APPARATUS FOR TREATING PARTICULATE MATERIAL

Paul Edmond Hanser, Moline, Ill., assignor to HWH Corporation, Rock Island, Ill.

Filed Jan. 6, 1975, Ser. No. 538,529

Int. Cl.² F26B *13/10*

U.S. Cl. 34—56 **15 Claims**



1. An apparatus for treating particulate material, comprising

A. an elongate generally cylindrical drum having an inlet at one end and an outlet at the other end,

B. means supporting said drum in a generally horizontal position for rotation around its longitudinal axis,

C. means for selectively rotating said drum,

D. means for receiving a supply of particulate material to be treated,

E. means for feeding a selectively variable quantity of material from said supply means through said inlet into said drum during rotation thereof,

F. means operable upon rotation of said drum for cascading material received therein generally transversely through the central core portion thereof while permitting longitudinal movement of said material toward said outlet,

G. a closure supported proximate the other end of said drum substantially surrounding said outlet,

H. said closure having a discharge port communicating with said outlet,

I. means for expressing a heated gas stream through said outlet into said central core portion of said drum,

J. means for venting said gas stream through said inlet after said stream has traversed the length of said drum through said cascading material, and

K. means for removal of treated material from said apparatus, said means comprising

i. a diverter movable from an inoperative position spaced from said cascading material to an operative position projecting into the path of and intercepting material cascading within said drum proximate said outlet and diverting said intercepted material through said outlet into said discharge port for discharge from said apparatus, and

ii. means for moving said diverter between said positions and for selectively varying said projection of said diverter when in said operative position to control the quantity of material removed from said drum.

3,943,638

CONDENSATE REMOVAL DEVICE

James A. W. Robson, 118 Viking Ave., Point-Claire, Quebec, Canada

Continuation of Ser. No. 221,337, Jan. 27, 1972, abandoned. This application Nov. 19, 1974, Ser. No. 525,097

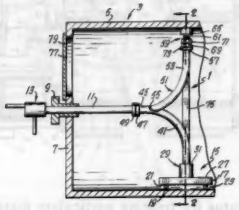
Claims priority, application Canada, Jan. 27, 1971, 103838

Int. Cl.² F26B *11/02*

U.S. Cl. 34—124 **6 Claims**

1. A device for use in removing condensate from the interior of a rotatable steam dryer drum comprising:

a. a condensate pick-up head
b. a substantially rigid unitary pick-up tube, one end of the pick-up tube connected to the pick-up head, the opposite end of the pick-up tube having means for connecting it to an outlet conduit leading from the drum, the pick-up tube being continuously curved substantially throughout its length to have its opposite end extend in a direction substantially transverse to the direction in which the one end extends,
c. support means connected to the pick-up tube and terminating in a free end which extends in a direction substantially transverse to the direction in which the opposite end of the pick-up tube extends,



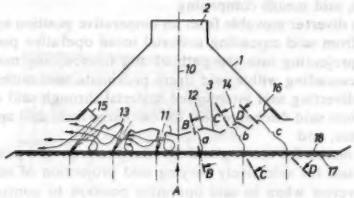
d. threadably adjustable means mounted on the support means at its free end, and means provided for locking the threadably adjustable means,
e. said support means including a substantially rigid unitary support tube continuously curved substantially throughout its length and being substantially symmetrical with said pick-up tube, and
f. a bracing member connected between and being substantially axially concentric with said pick-up tube and said support tube.

3,943,639

AIR NOZZLE FOR DRYING A FABRIC WEB SUPPORTED ON SUPPORTING MEANS

Hilmar Vits, Leichlingen, Germany, assignor to Vits-Maschinenbau, Germany

Filed Nov. 12, 1973, Ser. No. 415,169
Claims priority, application Germany, Nov. 16, 1973, 2256087
Int. Cl.² F26B *13/02*
U.S. Cl. 34—155 **4 Claims**



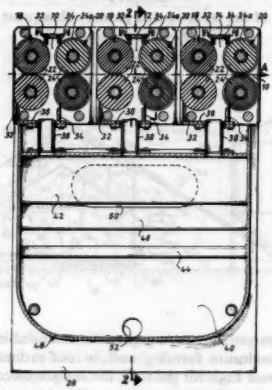
1. Air nozzle for drying a fabric web supported on a supporting means, comprising a nozzle head which is arranged transversely in relation to the fabric web, and which has a number of rows of adjacent nozzle holes extending in the nozzle head direction and located on the side facing the fabric web, characterised in that the blowing direction of the nozzle holes in the discharge direction of the air blast, from the nozzle center to the edges, decreases in steepness from one row to the next, nozzle holes located in the same row having the same cross-section, where the cross-section of the individual nozzle holes, measured from the center of the air nozzle to the nozzle edges, increases from row to row, where the total cross-section of the nozzle holes of each row is however constant, and where the distance of the nozzle holes from the point of impingement of the appropriate jet core, from the center of the air nozzle to the nozzle edges, progressively increases from row to row.

3,943,640

APPARATUS FOR DRYING STRANDS OF PLASTICS MATERIAL DURING THE MANUFACTURE OF PLASTICS GRANULES

Rudolf Paul Fritsch, Goslarer Str. 59, 7 Stuttgart 31, and Eckhard Reiner Bohnert, Stiegelstr. 42, 7141 Schwieberdingen, both of Germany

Filed Oct. 15, 1974, Ser. No. 514,735
Claims priority, application Germany, Oct. 13, 1973, 2351503
Int. Cl.² F26B *25/00*
U.S. Cl. 34—242 **3 Claims**

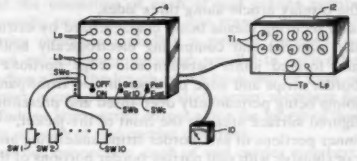


1. Apparatus for drying a wet strand of plastic material which has been passed through a cooling bath during a manufacturing operation, said apparatus comprising
a pair of cooperating rolls;
means mounting said rolls in cooperative relationship with peripheral surface portions thereof in the area of cooperation forming a gap for the passage of said strand therethrough,
a pair of feed rolls,
at least one of said feed rolls having a resilient peripheral surface,
means mounting said feed rolls with the surfaces thereof making line contact over substantially the entire lengths thereof to form a seal,
said seal providing a nip through which said strand extends,
means for driving at least one of said feed rolls to advance said strand through said gap,
means for rotating said cooperating rolls in the direction of movement of said strand through said gap,
and means for passing a stream of air through said gap simultaneously with the movement of said strand through said gap.

3,943,641
AUDIENCE RESPONSE SYSTEM

John Peter Dworetzky, 819 E. First North, Apt. No. 2, Logan, Utah 84321

Filed Apr. 10, 1974, Ser. No. 459,479
Int. Cl.² G09B 5/00
U.S. Cl. 35—8 R 7 Claims

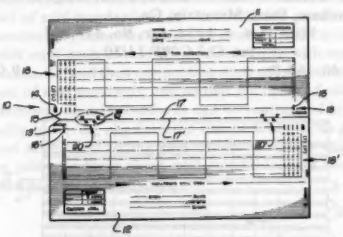


1. An audience response system comprising
first and second groups of visual indicators, each indicator in one group being paired with an indicator in the other group,
a plurality of switches, each for distribution to and use by a different member of an audience and each corresponding to a different pair of said indicators and having first and second positions, said switches each being manually operable to activate one indicator of a corresponding pair while in the first position and to activate the other indicator of the pair while in the second position,
a plurality of timers, each coupled to a different one of said switches for activation while the corresponding switch is in the first position to thereby indicate the duration that the corresponding switch is in the first position,
an additional timer, and
an additional switch coupled to said additional timer and said plurality of timers for deactivating the plurality of timers and activating the additional timer when the additional switch is in a first position, and for deactivating the additional timer when the additional switch is in a second position.

3,943,642
TRIM MARKS OF EQUILATERAL TRIANGULAR SHAPE

Michael Sokolski, Newport Beach, Calif., assignor to Scan-Tron Corporation, Los Angeles, Calif.

Filed Oct. 9, 1974, Ser. No. 513,286
Int. Cl.² G06K 19/04
U.S. Cl. 35—48 R 6 Claims

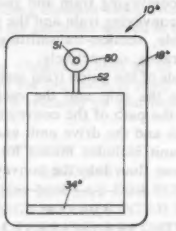


1. Trim marks for a page to be severed along a trim line to form a sheet containing indicia to be read automatically by sensors aligned a fixed distance from a severed edge of said sheet, said trim marks comprising:
a first set of equilateral triangles printed on said page on one side of the desired trim line, each triangle in said first set being oriented with one corner along said trim line and one side adjacent said corner extending perpendicular to said trim line, so that the side opposite said one corner is parallel to said trim line but spaced therefrom, the length of said one adjacent side being equal to the maximum acceptable trim tolerance for severance offset in the direction of that first set, and
a second set of equilateral triangles printed on said page on the opposite side of the desired trim line, each triangle in said second set being oriented with one corner along said trim line and one side adjacent said corner extending perpendicular to said trim line so that the side opposite said one corner is parallel to said trim line but spaced therefrom, the length of said one adjacent side being equal to the maximum acceptable trim tolerance for severance offset in the direction of said second set, whereby when said page is severed exactly on said trim line, only the corner points of said triangles are visible at the severed edge of said sheet, and whereby when said page is severed off said trim line but within tolerance, the width of the truncated triangle visible at the severed edge of said sheet corresponds exactly to the amount of offset of the severed edge from said trim line.

3,943,643
PNEUMATICALLY CLEARED TOY SLATE

John B. Fisher, Buffalo, and Donald W. Scott, East Aurora, both of N.Y., assignors to Scott-Fisher Development Company, East Aurora, N.Y.

Filed Mar. 18, 1974, Ser. No. 452,051
Int. Cl.² B43L 1/12
U.S. Cl. 35—66 10 Claims



1. A toy slate comprising
a laminated slate means including a slate board, and a transparent plastic cover sheet having a translucent milky layer thereunder; and
a bellows means operatively connected to the slate means between the slate board and the adjacent layer so that a sudden compressive force applied to the bellows means forces a blast of air to flow between the slate board and the layer to separate the layer from the slate board and erase any marking appearing on the slate means.

3,943,644
MINING DREDGE HAVING ENDLESS BUCKET CONVEYOR AND FLEXIBLE GUIDE TRAIN

Alfons Walz, Alfons-Walz-Strasse 1-5, 7967 Bad Waldsee, Germany

Filed June 25, 1974, Ser. No. 483,068
Claims priority, application Germany, June 25, 1973, 2332198
Int. Cl.² E02F 3/08
U.S. Cl. 37—69 41 Claims

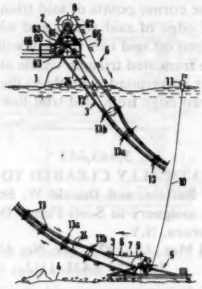
1. A device for mining the ocean floor or the bottom of some other body of water for ore nodules, mineral soaps and ore sludge by extracting these deposits and conveying them upwardly to a ship or some other suitable carrier, the device comprising in combination:
a drive unit adapted for mounting on board the ship;

a receiving unit arranged for placement on the ocean floor;

a guide train assembly extending between the drive unit and the receiving unit;

an endless conveying train extending along the guide train assembly between the drive unit and the receiving unit and having descending and ascending conveying strands with conveying receptacles attached thereto; a drive drum on the drive unit and a reversing drum on the receiving unit guiding the upper and lower end portions of the conveying train; and

means defined by the guide train assembly for guiding the descending and ascending strands of the conveying train



therealong, so as to prevent interference between the strands; and wherein:

the combined comveying train and guide train assembly is flexible, the conveying train and the guide train assembly having flexible, tension-transmitting conveying strands and guide strands, respectively;

the guide strands of the guide train assembly, form a tensile link between the ship and the receiving unit, thereby determining the path of the conveying train between the receiving unit and the drive unit; and

the receiving unit includes means for extracting deposits from the ocean floor into the conveying receptacles.

3,943,645

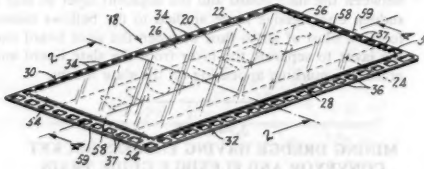
SELF-SUPPORTING TRANSPARENT JACKET FOR DATA SHEETS OR THE LIKE

Eric A. Viesturs, c/o Connecticut Aircraft Corp., 41 Monroe Turnpike, Trumbull, Conn. 06611

Continuation-in-part of Ser. No. 48,029, June 22, 1970, abandoned. This application Nov. 7, 1972, Ser. No. 304,395

Int. Cl.² G09F 3/18

U.S. Cl. 40—10 D **1 Claim**



1. A self-supporting transparent jacket for mounting and protecting display articles such as stamps, coins, samples of material, photographic prints, small or large sheets or cards and the like having information contained thereon, and for attaching said articles to a supporting surface, comprising in combination:

a. a single, rectangular, transparent thermoplastic front panel of material selected from the group consisting of polyvinylchloride and polyurethane, said front panel being adapted to overlie the article and protect the same while permitting it to be fully viewed,

b. a pair of separate, elongate, ribbon-like border strips extending respectively along the back of one pair of opposite narrow border portions of the front panel,

c. means securing the border strips along at least one elongate narrow edge portion and each along two transverse narrow edge portions thereof to corresponding narrow edge portions of the front panel so as to form a shallow, pocket-like receiving space thereby which is located at one border portion of the front panel, thereby to lock in the display article along three sides,

d. said securing means being characterized by extrusion of the material and comprising electronically heat-sealed and formed joints between said edge portions of the border strips and edge portions of said front panel, said joints being permanently deep-fused and presenting configured surface areas at the front of the jacket,

e. inner portions of said border strips underlying and being coextensive with said narrow border portions of the front panel, said inner portions of the border strips being free of said narrow border portions whereby a sheet-like article of the proper size can have one of its edge areas inserted and interposed between said front panel and one of said border strips in the shallow receiving space formed thereby, so as to positively postition the sheet-like article along three adjoining sides with its front face in full view behind the front panel,

f. a pressure-sensitive adhesive coating on the back surfaces of at least one of the border strips,

g. release paper temporarily covering and adhered to said pressure-sensitive adhesive coating,

h. the width of the elongate ribbon-like border strips being each substantially less than one-half the distance between said opposite narrow border portions of the rectangular front panel,

i. said electronically heat-sealed and formed joints of the front panel and border strips being constituted of the narrow edge portions thereof, which edge portions are heat-fused to one another and which constitute the said securing means,

j. one of said border strips having both of its elongate, narrow edge portions free and unattached,

k. said one border strip along its entire length extending beyond the adjoining edge of the front panel so as to be exposed at the front of the jacket, thereby to enable a display article to be readily inserted behind the front panel and in front of said one border strip, with the jacket in place on a supporting surface.

3,943,646

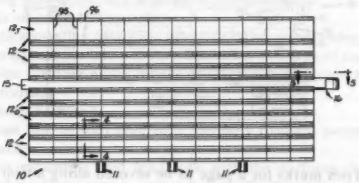
DISPLAY BOARD CONSTRUCTION

Norvel R. Branham, Stone Mountain, Ga., assignor to Norvel R. Branham, Stone Mountain, Ga.

Filed Mar. 4, 1974, Ser. No. 447,987

Int. Cl.² G09F 11/30

U.S. Cl. 40—64 R **9 Claims**



1. A display board construction adapted to be mounted on a generally vertical support surface for use in displaying certain data comprising:

at least two generally vertically oriented standards, and means for mounting said standards on the support surface in spaced apart parallel positions with a first prescribed distance therebetween, each of said standards including a pair of laterally opposed ribs parallel to each other

extending along the length thereof generally vertically and parallel to the support surface;

a plurality of elongate carrier members, each of said carrier members having a length greater than said first prescribed distance between said standards and further having a front side, a back side, and a longitudinal centerline, each of said carrier members being horizontally oriented so that the centerline of each of said carrier members is generally perpendicular to said standards, each of said carrier members including a pair of opposed, spaced apart carrier flange members parallel to each other extending along the length of the back side of each of said carrier members, each of said carrier members further defining a strip carrier cutout along the length of the front side of each of said carrier members;

at least two connectors, each of said carrier members having a different connector connecting said carrier member to each of said standards, each of said connectors having a forward end and a rear end, and comprising a pair of opposed, spaced apart connector flange members on the forward end of each of said connectors oriented along a first axis lying in a first plane and a pair of spaced apart, opposed resilient ears on the rear end of each of said connectors oriented along a second axis lying in a second plane where the second axis is perpendicular to the first axis and the second plane is perpendicular to the first plane, one of said connectors connecting each of said carrier members to each of said standards so that each of said carrier members has a plurality of connectors associated therewith with one connector associated with each of said standards, said connector flange members of each of said connectors slidably engaging said carrier flange members of one of said carrier members so that each of said connectors is slidably movable along the length of said carrier member, and said ears of each of said connectors resiliently engaging said opposed ribs on one of said standards to mount said connector on said standard so that each of said connectors can be selectively removed from said standard on which said connector is mounted by forcing said ears from over said ribs and so that said connector can be selectively and slidably moved along the length of said standard; and,

a plurality of flexible elongate strips, and means whereby each of said flexible elongate strips is removably carried along said cutout in each of said carrier members and onto which the date is recorded for display so that the display board can be assembled in any convenient size using said standards, said carrier members and said connectors by slidably mounting the same number of said connectors on each of said carrier members as the number of said standards to be used, slidably positioning said connectors along the length of each of said carrier members until each of said connectors aligns with one of said standards, and then connecting each of said connectors to one of said standards; and so that the order of said carrier members on said standards can be rearranged by individually removing any selected one of said carrier members and selectively sliding said carrier members still carried by said standards along said standards until the desired rearrangement is reached.

3,943,647

DEVICE FOR RECORDING ON AND STORAGE OF INFORMATION CARDS

Peter. E. Holtsch, 6204 Taunusstein-Wingbach, Germany

Filed Feb. 25, 1974, Ser. No. 445,720

Claims priority, application Germany, Feb. 24, 1973, 2309412

Int. Cl.² G09F *11/06*

U.S. Cl. 40—73.4 **11 Claims**

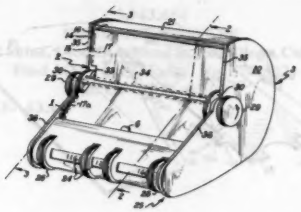
1. A device for storing and recording on information cards composed of flexible material comprising:

a. means for pivotally mounting each card along one edge thereof within a housing having an observation opening for the information cards,

b. holding means fixedly located along a side edge of the observation opening and a holding support element disposed along the lower edge of the observation opening,

c. the said holding means including at least one magnet disposed on the side edge of and at a location below the lower edge of the observation opening,

d. said cards including a strip of magnetizable material disposed along its outer free edge thereof to cooperate with the magnets for magnetically holding the card,



e. said support holding element being pivotally mounted to swivel in one direction out of the path of the cards as the cards move downwardly past the lower edge of the observation opening,

f. said support holding element being effective to hold the card back when the cards are moved in the upward direction,

g. said cards being elastically held up to a predetermined tension sufficient for the cards to jump to an upstanding position once it is released by said holding support element.

3,943,648

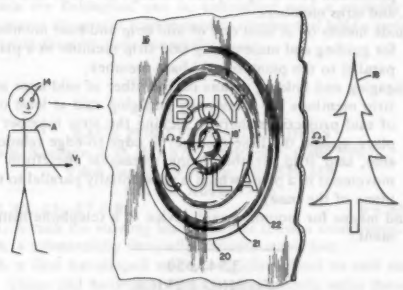
TRANSPARENT SIGN DISPLAY FOR SUPERIMPOSING TRANSPARENT SIGN WITH PRINTED MESSAGE ON BACKGROUND DISPLAY

Karl E. Sterne, San Francisco, Calif., assignor to Optical Sciences Group, San Rafael, Calif.

Filed Mar. 5, 1975, Ser. No. 555,503

Int. Cl.² G09F *19/02*

U.S. Cl. 40—106.51 **2 Claims**

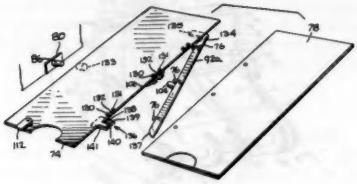


1. A transparent advertising display for placement on a transparent panel having a background display comprising: a negative fresnelled lens having a first fresnelled side and a second planar side; a message imprinted on the planar side of said negative fresnelled lens, the planar side of said negative fresnelled lens being fastened to the glass of said store front display.

3,943,649
TELEPHONE INDEX DEVICES

James P. Foley, Crest Road, Katonah, N.Y. 10536

Continuation of Ser. No. 233,480, Mar. 10, 1972, abandoned. Ser. No. 450,476, Mar. 12, 1974 is a division of said Ser. No. 233,480, which is a continuation-in-part of Ser. No. 116,384, Feb. 18, 1971, U.S. Pat. 3,792,544, which is a continuation-in-part of Ser. No. 8,660, Feb. 4, 1970, abandoned, which is a continuation-in-part of Ser. No. 837,405, June 30, 1969, U.S. Pat. 3,706,503. This application July 15, 1974, Ser. No. 488,498
This application July 15, 1974, Ser. No. 488,498
Int. Cl.² G09F 3/00
U.S. Cl. 40—336 17 Claims



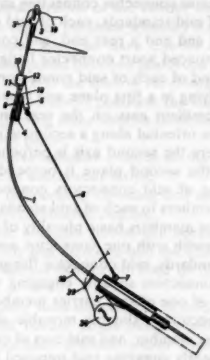
1. A telephone index device comprising:
a flat slab-like base member of a substantially rectangular configuration for supporting a stack of index sheets on an upper surface thereof, a stack of index sheets each of said sheets having spaced apertures along at least one side thereof,
an elongated closure strip member mounted adjacent one of the longer edges of said substantially rectangular base member for movement toward and away from said edge, said base member and strip member lying in the same plane,
a plurality of inverted integral U-shaped loops mounted in spaced relation on one of said strip and base members with one leg thereof secured to said one of said members and with the other leg thereof having a free end overlying and contiguous to the upper surface of the other of said strip and base members, said loops being designed to engage the apertures in the index sheets,
and means for releasably maintaining said strip member adjacent said one of said longer edges of said base member such that the free ends of the loops is closed off by one of said strip and base members to secure the index sheets on said loops, said means comprising at least one projection extending beyond the edge of one of said base and strip members,
guide means on at least one of said strip and base members for guiding and maintaining said strip member in a plane parallel to the plane of said base member,
engaging and holding means on the other of said base and strip members for frictionally engaging said at least one of said projections thereby locking the strip member in place against the base member in edge-to-edge relationship, said strip member being releasable therefrom by movement in a plane which is substantially parallel to the plane of the base;
and means for mounting said device to a telephone instrument.

3,943,650
FISHING DEVICE

Ingemar Johansson, and Bjarne Reinertsen, both of Skiftesgatan 2, Goteborg, Sweden (41706)

Filed Dec. 10, 1974, Ser. No. 531,336
Claims priority, application Sweden, Dec. 20, 1973, 73171720
Int. Cl.² A01K 97/00
U.S. Cl. 43—15 12 Claims

1. In a fishing device of the type comprising a fishing rod having a resilient rod tip, a fishing line, means for supporting the fishing line at said tip and means for bowing said tip when said fishing line is baited, an improved tripping device for bringing the tip back to a straight position when a pulling force is exerted by a fish on said fishing line, said tripping device comprising means arranged on said tip for releasably supporting a member having a first hook shaped surface for engagement with said means and a second contact surface; a second line having opposite ends, means on said member for attaching said member to one end of said second line; means on said fishing rod at a position remote from said member for attaching the other end of said second line to the rod, the length of the second line being such that when the first hook shaped surface of said member is supported by the support means, the rod tip is in a tensioned, bowed position; and means displaceably arranged on the rod tip and having a tripping surface for

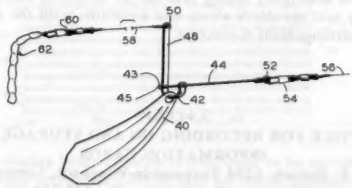


engagement with said second contact surface of the member supported by the support means and for pushing said member away from the support means when a predetermined force is exerted on said fishing line and the displaceable means arranged on the rod tip is pressed against said second contact surface, the arrangement being such that for setting said predetermined force, the displaceable means is displaced for bringing the tripping surface thereof into engagement with the second contact surface of the member supported by the support means for placing the first hook shaped surface of said member in a predetermined position in said support means.

3,943,651
OFFSET SPINNER

Eric Robert Erving, 1313 Church St., Baker, Oreg. 97814

Filed June 13, 1975, Ser. No. 586,524
Int. Cl.² A01K 85/00
U.S. Cl. 43—42.19 7 Claims



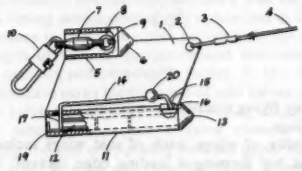
1. In an offset spinner,
core wire means having a longitudinal axis,
clevis means connected to the core wire means,
a spinner blade connected to the clevis means at a point offset from said axis for revolving the clevis means around said axis,

a leader,
and offsetting arm means connected to the clevis means and revolved thereby and carrying the leader at the outer end of the arm means.

3,943,652
FISHING LEADER
Aaron F. Aunspaugh, 5638 Northridge, Houston, Tex. 77033
Filed Feb. 4, 1974, Ser. No. 439,003
Int. Cl.² A01K *91/00*
U.S. Cl. 43—42.74 **5 Claims**

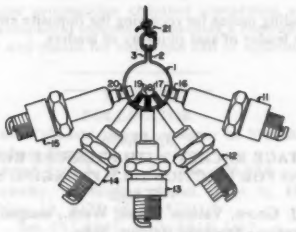
1. A leader apparatus for installation on a fishing line and adapted to support a fish hook, comprising:
a main leader line adapted to be connected to a fishing line at its upper end and a weight at its lower end:
at least one laterally extending means supported at some point along said main line and adapted to receive and support a fish hook at the side of and remote from said main line, and wherein said laterally extending means includes first and second lateral lines connected to and supported by said main line and which come together at a point laterally of said main line such that said lateral lines hold themselves to the side of said main line and thereby support a fish hook on a short line connected to and located laterally of said main line and free of entanglements with said main line; and
an elongate brace line connected by a connector means to said lateral lines which is curved from a point of connection to said main line to said lateral lines constructed and arranged such that said brace line holds said lateral lines at the side of said main line and supports a load on a hook.

3,943,653
FISHING LINE RUDDER
Lawrence L. Reckler, 984 Bates Ave., Reno, Nev. 89502
Filed Apr. 25, 1975, Ser. No. 571,541
Int. Cl.² A01K *95/00*
U.S. Cl. 43—43.13 **5 Claims**



1. A fishing line rudder comprising a thin, flat rudder vane adapted to be connected at the front to a fishing line and normally disposed in a vertical running position, means adapted to couple the rudder vane at a rearward point to a leader trailing a lure, a weight-receiving receptacle on the rudder vane in proximity to its lower edge, the receptacle having an access opening to permit the placement of weights in or removal thereof from said receptacle, and movable means normally closing said access opening; the receptacle being tubular and extending in fixed relation longitudinally of said lower edge of the rudder vane, the open rear end portion of such tubular receptacle providing such access opening, and said movable means being a springurged gate spanning transversely across said rear end portion of the tubular receptacle in closing relation thereto.

3,943,654
FISHINGLINE SINKER
Jerry Paul Shine, 1460 Hornblend St., San Diego, Calif. 92109
Filed May 16, 1975, Ser. No. 578,307
Int. Cl.² A01K *95/00*
U.S. Cl. 43—43.14 **1 Claim**



1. A weighting device which comprises at least one sparkplug and means for connecting at least one sparkplug to a fishingline, said means comprising a flat strip of flexible material bent into a circular shape, with both ends at right angles and projecting toward the outside of a circle delineated by the flexible strip, said ends having matching apertures through which the fishingline can be connected, and a plurality of apertures along said strip shaped to receive and hold a variety of sparkplugs by their terminals.

3,943,655
RACK FOR STOWING LEADERS
Lee S. Simpson, P.O. Box 879, Castroville, Calif. 95012
Filed Dec. 4, 1974, Ser. No. 529,359
Int. Cl.² A01K *97/06*
U.S. Cl. 43—57.5 R **6 Claims**

1. A rack for stowing leaders under tension comprising:
A. a substantially vertically oriented stanchion;
B. a first bar-shaped retainer rigidly affixed to said stanchion and having provided at the opposite sides thereof a pair of tensioned suspension wires arranged in parallelism, each being adapted to support in suspension one end portion of a selected plurality of leaders;
C. means including an annular body rigidly affixed to said stanchion, in vertically spaced relation with said first bar-shaped retainer, for supporting the mid-portion of each leader of said plurality of leaders in a circumscribing relationship therewith; and

D. a second bar-shaped retainer rigidly affixed to said stanchion in vertically spaced relation with said annular body

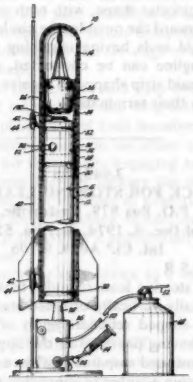
including means for receiving the opposite end portion of each leader of said plurality of leaders.

3,943,656

TWO STAGE ROCKET WITH PRESSURE RESPONSIVE MEANS FOR FRICTIONALLY ENGAGING SECOND STAGE

Charles J. Green, Vashon Island, Wash., assignor to Damon Corporation, Needham Heights, Mass.

Division of Ser. No. 223,452, Feb. 4, 1972, Pat. No. 3,820,275.
This application Mar. 25, 1974, Ser. No. 454,088
Int. Cl.[2] A63H 27/06
U.S. Cl. 46—74 C 6 Claims



1. A toy rocket comprising:

a first stage having a body housing a rocket motor, said motor comprising:

a motor body having means defining a propellent cavity for receiving and holding a pressurized propellent fluid, and also defining a second cavity for receiving and holding a pressurizing gas, said motor body having means communicating between said second cavity and the exterior thereof including at least one aperture extending through a peripheral wall of said second cavity;

a nozzle connected to said motor body and communicating between said propellant cavity and the exterior of said motor;

pressure responsive means for sealing said communicating means and said second cavity when it is pressurized, said pressure responsive means comprising a member of flexible, resilient material disposed across said aperture on the inside of a peripheral wall of said second cavity and being capable of extending through said aperture in response to pressure increases within said second cavity;

the propellant cavity means including a flow channel in fluid communication between said propellent cavity and said second cavity; and

means for restricting fluid passage through said flow channel, including a restriction member, said restriction member being pervious to gas and substantially impervious to liquid;

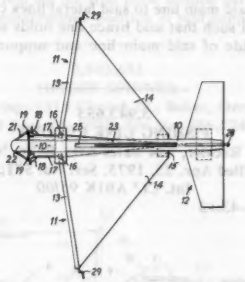
a second stage having a body portion adjacent said second cavity exterior, said pressure responsive means frictionally engaging said second stage body portion through said aperture when said second cavity is pressurized.

3,943,657

TOY FLYING MACHINES

Robert Malcolm Paul Leckie, 33 Halford Road, Richmond, Surrey, England

Filed Oct. 4, 1973, Ser. No. 403,412
Claims priority, application United Kingdom, Oct. 4, 1972, 45789/72; Mar. 5, 1973, 10479/73
Int. Cl. A63h 27/00
U.S. Cl. 46—80 7 Claims



1. A toy flying machine comprising

a fuselage,

a plurality of wings, each of said wings including a rigid front bar forming a leading edge thereof, and flexible sheet material attached to said bar and to said fuselage and for providing an aerofoil surface for the wing in operative position thereof,

means for pivotally mounting said bars of said wings to said

fuselage so that they are movable between an operative position wherein said flexible sheet material provides an aerofoil surface and maximum gliding of the machine is possible, and a retracted position wherein said flexible sheet material is folded up and minimum machine air resistance is provided,

biasing means for exerting a biasing moment on said wings which is less in said retracted position than during pivoting of said wings toward operative position, and

means subject to aerodynamic pressure dependent upon the forward motion of the machine for controlling movement of said wings between said retracted and said operative positions.

3,943,658

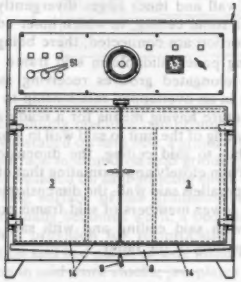
INTENSIVE CULTIVATION

Harry Wong Hon Hai, Kowloon, Hong Kong, assignor to Winner Food Products Limited, Kowloon, Hong Kong

Filed June 24, 1974, Ser. No. 482,334

Int. Cl.² A01G *31/00*; A01C *1/00*

U.S. Cl. 47—1.2 **6 Claims**



1. Intensive cultivation apparatus comprising a chamber having an air vent and a water drainage outlet, a plurality of spray means in the roof of the chamber, a reservoir for supplying water to the spray means, a thermostatically controlled heater arranged to heat the water supplied to the spray means, a plurality of valves regulating the supply of water from the reservoir to the respective spray means, a plurality of valve actuating mechanisms operatively associated with the respective valves, a timing device operatively connected to the actuating mechanisms to open the valves sequentially for a predetermined length of time at predetermined intervals, and a plurality of open-topped removable boxes in the chamber below the respective spray means, each of said valves comprising a tubular valve-seat, a guide rod extending longitudinally through the tubular valve-seat, a valve closure member mounted on the rod and cooperating with the upper end of the valve-seat in order to open and close the valve, a spring connecting the rod to the respective said actuating mechanism, a collar rigid with the valve-seat and guiding the rod, and a stop mounted on the rod below the collar to limit the upward travel of the rod when the valve is opened by the respective actuating mechanism.

3,943,659

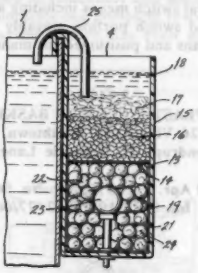
FILTRATION AND CIRCULATION SYSTEM AND APPARATUS THEREFORE

Louis N. Katz, 13415 Land O'Woods Drive, St. Louis, Mo. 63141

Division of Ser. No. 380,228, July 18, 1973, Pat. No. 3,835,813. This application July 10, 1974, Ser. No. 487,222

Int. Cl.² A01G *7/00*

U.S. Cl. 47—1.4 **10 Claims**



1. An algae propagation chamber comprising a housing filled with transparent spheres surrounding a centrally located light source and means for entry and exit of aqueous media.

3,943,660

POLLINATOR

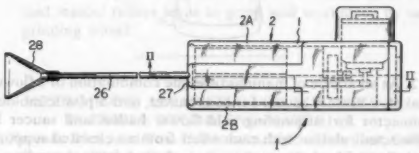
Hideo Hosaka, Takasaki, Japan, assignor to Max Kabushiki Kaisha, Tokyo, Japan

Filed June 3, 1974, Ser. No. 475,750

Claims priority, application Japan, June 9, 1973, 48-68042[U]; Nov. 19, 1973, 48-133553[U]

Int. Cl.² A01G *7/00*; A01H *1/02*

U.S. Cl. 47—1.41 **10 Claims**



1. A pollination device, comprising:

housing means defining a substantially pistol-shaped casing having a substantially horizontal and elongated upper section, said casing also having a hollow lower section projecting downwardly from the upper section adjacent one end thereof;

a pollen storage container attached to said housing means and defining therein a compartment adapted to contain a quantity of pollen, said pollen storage container being removably mounted on the lower end of said lower section;

a power source mounted on said housing means, said power source including battery means removably positioned within said upper section adjacent the other end thereof;

pump means mounted on said housing means for supplying air into said compartment, said pump means being positioned within said casing adjacent said one end of said upper section and having a discharge port connected so as to communicate with said compartment;

conduit means providing communication between said compartment and a location disposed externally thereof for permitting discharge of pollen from said compartment, said conduit means having the inlet end thereof

positioned in communication with said compartment and having a discharge nozzle formed on the outlet end thereof; and

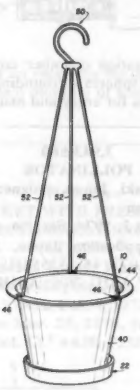
actuator means for actuating said pump means to cause air to be supplied to said compartment so that the air picks up the pollen in said compartment and discharges same through said discharge nozzle, said actuator means including manually-actuated electrical switch means mounted on said housing means for connecting said power source to said pump means for activating same, said electrical switch means including at least one manually actuated switch portion movably mounted on said housing means and positioned for manual actuation.

3,943,661

PLASTIC FLOWER BASKET

Joseph DeVito, 26 Villa Lane, Smithtown, N.Y. 11787, and Donald L. Tendrup, 32 Delmarie Lane, Nesconset, N.Y. 11767

Filed Apr. 21, 1975, Ser. No. 569,921
Int. Cl.² C10G 9/02, 27/00
U.S. Cl. 47—35 **2 Claims**



2. As an article of manufacture, the combination of a flower basket, a bottom saucer for said basket, and a plastic molded connector for suspending said flower basket and saucer in connected relation with each other from an elevated support: said flower basket comprising a shaped body bounding a compartment for a supply of earth for growing plaints in said basket, said body having an upper opening into said compartment with a circular flange extending laterally thereabout, said flange having three keyhole slots circumferentially spaced thereabout, and a bottom wall on said body having four circumferentially spaced openings therein; said bottom saucer having four upstanding connecting projections in said same circumferential spacing as said bottom wall openings projecting in a force fit through said openings for achieving said connected relationship of said saucer with said flower basket; and said plastic molded connector comprising three connecting members which during the suspension of said flower basket have an operative condition circumferentially spaced from each other and diverging outwardly from a common point to their connection with said flower basket, an enlarged-sized projection at the end of each said connecting member adapted to be projected through a cooperating one of said keyhole slots and laterally snapped into place therein for completing said connection to said flower basket, a hook extending from said common point for completing a connection between said connector and said support, said connecting members being molded of a pliable plastic material in a common molding plane, said material being sufficiently pliable so that after said molding said connecting members are readily separated without breaking into plural planes as required by said operative outwardly diverging condition.

3,943,662

CASEMENT WINDOW CONVERSION UNIT

Frank La Rosa, 704 Cora St., Wyandotte, Mich. 48192

Filed Dec. 26, 1974, Ser. No. 532,752
Int. Cl.² E05C 7/02
U.S. Cl. 49—63 **1 Claim**

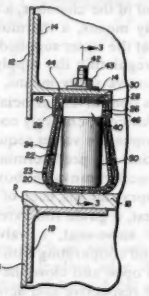
1. A conversion unit for mounting internally of and over the wall opening of a casement or like room window to ornamentally convert the latter; said unit comprising a frame structure having a pair of like upright end members applicable in outwardly abutting relation at 90° to a wall affording said opening, an inner frame portion connected at its opposite ends to said members in an inwardly and upwardly extending relation to said wall, and at least one panel of light-transmitting material mounted in said inner frame portion to extend in a direction parallel to said wall, said end members of the frame structure being triangular, presenting outer edges in abutting relation to the wall and inner edges divergently angling upwardly toward a room ceiling, to which inner edges the ends of said frame portion are connected, there being at least two light-transmitting panels slidable in said frame portion, said portion having elongated grooves receiving said panels to adjustably slide in an overlapped relationship to one another, said frame structure having means for a ready and manually releasable mounting of the unit to said wall in a predetermined close relationship to said ceiling, the dimensioning of said inner frame portion closely approximating that of said window as said portion parallels said wall, the dimensioning being such that upper and lower members of said frame portion respectively engage with said ceiling and with said wall directly beneath said opening of the latter.

3,943,663

ASTRAGAL

James M. Jecmen, Brookfield, and John J. Jecmen, Riverside, both of Ill., assignors to Harris Preble Company, Cicero, Ill.

Filed Dec. 6, 1974, Ser. No. 530,206
Int. Cl.² E06B 7/16
U.S. Cl. 49—370 **12 Claims**



1. An astragal for an elevator door, said astragal comprising an elongated envelope formed by joining an inner layer of

flexible fire-resistant material and outer layer of flexible fire-resistant material, said outer layer being of greater dimension than said inner layer within the area of said envelope portion, said outer layer having exextensions on both sides beyond the area of said envelope portion, a mounting bar having door engaging means thereon adapted to attach said astragal to an elevator door, said envelope being shaped whereby said envelope forming joints are contiguous to said mounting bar, and said outer layer extensions being affixed to said mounting bar by said door engaging means.

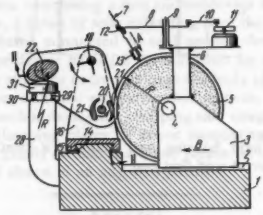
3,943,664
PROFILE-GRINDING MACHINE

Pinkhus Ruvimovich Broide, prospekt Metallistov, 82, kv. 274; Igor Konstantinovich Surkov, ulitsa Zamshina, 25, korpus 2, kv. 156, and Andrei Nikolaevich Grachev, ulitsa Ryleeva, 39, kv. 1, all of Leningrad, U.S.S.R.

Continuation of Ser. No. 163,701, July 19, 1971, abandoned. This application Feb. 20, 1973, Ser. No. 333,467

Int. Cl.² B24B *17/02*

U.S. Cl. 51—5 D **2 Claims**



1. A profile-grinding machine comprising a bed; a grinding stock movably installed on said bed; a grindstone with a spherical working surface mounted on said grinding stock; a dressing mechanism installed on said grinding stock and interacting with the working surface of the grindstone for dressing its sphere as it gradually becomes worn; a bed plate installed on said bed with a provision for reciprocating motions; work stocks located on said bed plate; an axle installed with a provision for turning in said work stocks; jaw plates rigidly secured on said axle; an arbor for the work, installed between said jaw plates; a master form installed between said jaw plates, parallel to said arbor; said axle, master form and arbor being arranged so that they form an imaginary right-angle triangle with the axle located at the apex of its right angle while the master form and the arbor are located, respectively, at the apices of the acute angles; a contact member installed on said bed and interacting with said master form; the surface of the contact member interacting with the master form being of spherical shape whose radius of curvature is approximately equal to the radius of the grindstone.

3,943,665
APPARATUS FOR PROFILE GRINDING CLOSED CURVED SURFACE

Kazuo Nagashima, Numazu, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed July 29, 1974, Ser. No. 492,985

Claims priority, application Japan, July 31, 1973, 48-86025; Aug. 16, 1973, 48-91972

Int. Cl.² B24B *5/08, 17/00*

U.S. Cl. 51—101 R **8 Claims**

8. Apparatus for profile grinding a trochoidal curved surface comprising:

a worktable for supporting a workpiece,

means for rotating and translating said worktable in a predetermined plane,

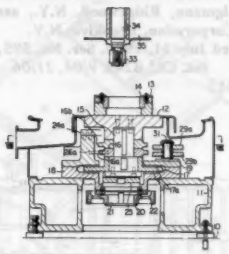
a shaft perpendicular to said plane for supporting a grinding wheel above said worktable,

means for feeding said shaft in a predetermined direction,

a pair of master rollers rotatably supported by the stationary portion of the apparatus at positions on both sides of a plane containing the axis of said shaft and extending in the direction of the feeding of said shaft,

a pair of master cams movable in a fixed relation with said worktable and are provided with two closed curved surfaces on the peripheries thereof,

means for rotating incrementally said worktable so that the worktable completes one complete revolution when said trochoidal curved surface has been ground, said two



closed curved surfaces on said master cams cooperating to define a profile corresponding to said trochoidal curved surface to be ground,

means for urging said two closed curved surfaces of said master cams against said two master rollers respectively,

and wherein an Oldam's coupling is interposed between a drive shaft and a spindle carrying said worktable and said pair of master cams so as to permit said spindle to rotate and translate in the same plane,

whereby the direction of movement of said worktable is controlled by the cooperation of said master cams and said master rollers so as to grind said workpiece by said grinding wheel.

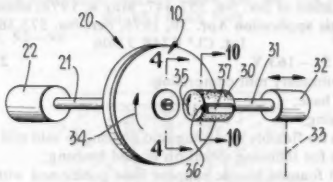
3,943,666
METHOD AND APPARATUS FOR BURNISHING FLEXIBLE RECORDING MATERIAL

C. Norman Dion, and Tom Y. Idemoto, both of San Jose, Calif., assignors to Dysan Corporation, Santa Clara, Calif.

Filed July 31, 1974, Ser. No. 493,447

Int. Cl.² B24B *7/04, 1/00*

U.S. Cl. 51—106 R **26 Claims**



1. A method of treating the recording surface of a flexible recording element to remove protruding agglomerates and improve the surface smoothness, said method comprising the steps of:

a. supporting said flexible recording element on a substantially resilient compressible support surface;

b. translating said recording surface of said recording element past an abrading region at a first rate; and

c. abrading said recording surface during translation thereof past said abrading region for a predetermined period with an abrasive element having substantially less resiliency than said compressible surface by moving the surface of said abrasive element past said abrading region at a second rate different from said first rate while pressing said recording surface against said support surface with said abrasive element with sufficient force to compress said support surface at said abrading region.

3,943,667

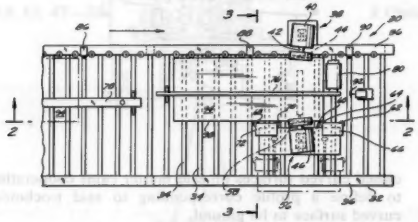
AUTOMATIC WELD GRINDING MACHINE

Gustave Hoenigmann, Ridgewood, N.Y., assignor to Acme Steel Door Corporation, Brooklyn, N.Y.

Filed July 11, 1975, Ser. No. 595,030

Int. Cl.² B24B *9/04, 21/06*

U.S. Cl. 51—112 **8 Claims**



1. A device for grinding longitudinal welds along the opposed sidewalls of a metal door or the like, said device comprising: a bed for receiving said door and defining a path for said door past first and second grinding means; means for moving said door along said bed; first grinding means affixed to said bed in position to operationally abut one sidewall of said door; carriage means connected to said bed on the opposite side of said door for transverse movement with respect to said bed; second grinding means secured to said carriage for movement therewith; means for moving said carriage; and, means affixed to said carriage for sensing a door and limiting the movement of said carriage to a position wherein said second grinding means operationally abuts the opposite sidewall of said door.

3,943,668

VIBRATORY MILL STRUCTURE

Richard K. McKibben, La Canada, Calif., assignor to Sweco, Inc., Los Angeles, Calif.

Continuation of Ser. No. 357,447, May 4, 1973, abandoned. This application Apr. 30, 1975, Ser. No. 573,383

Int. Cl.² B24B *31/06*

U.S. Cl. 51—163 V **2 Claims**

1. A vibratory mill comprising:

a mill base;

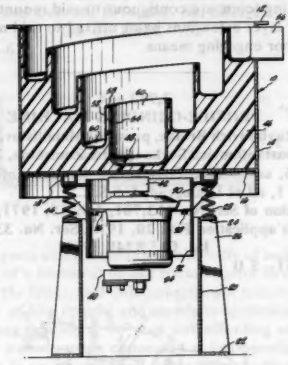
a housing;

means for flexibly mounting said housing to said mill base;

means for inducing vibration in said housing;

a rigid foamed plastic support base positioned within said housing; and

a rigid plastic liner cast within said support base, said liner and said support base forming a vertical wall spiralling outwardly and upwardly from a first end located centrally within said housing to the outer periphery of said housing and a floor which traverses the distance between succeeding turns of said vertical wall, said floor being inclined upwardly from said first end to the periphery of said housing, said vertical wall and said floor forming a chamber having substantially vertical sides and an inclined bottom and extending at least two and one-half turns



within said housing and defining a central receiving chamber at said first end.

3,943,669

GYRATORY SANDER

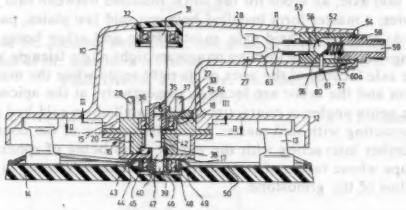
Reinhold Stroezel, Im Waldle 9, 7022 Leinfelden-Oberaichen, Germany

Filed May 8, 1974, Ser. No. 468,136

Claims priority, application Germany, May 9, 1973, 2323270

Int. Cl.² B24B *23/04*

U.S. Cl. 51—170 MT **12 Claims**



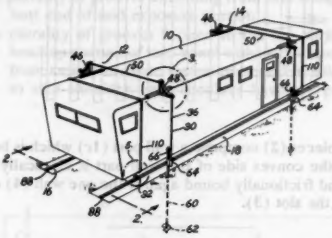
1. A gyratory sander, comprising a housing; a sanding plate mounted on said housing with freedom of gyratory motion; a rotatable eccentric shaft journalled in said housing and connected with said plate for imparting said motion to the latter; and a pneumatically powered rotary piston engine mounted in said housing and connected with said shaft for rotating the same, said engine having a casing formed with a chamber which has the shape of a multi-lobed epitrochoid, and a rotary piston rotatably mounted in said chamber and having apex portions which are in sealing engagement with an inner circumferential surface bounding said chamber, said rotary piston of said engine having an imbalance which compensates for imbalances resulting from said motion of said plate.

3,943,670

ANCHOR SYSTEM FOR MOBILE HOMES AND SIMILAR STRUCTURES

Milton J. Miller, 39 Greenway Drive, Goshen, Ind. 46526

Filed May 28, 1974, Ser. No. 473,914
Int. Cl.² E04H 9/14, 12/20
U.S. Cl. 52—23 7 Claims



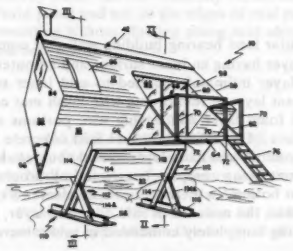
1. An anchoring system for mobile homes, trailers and similar vehicles, comprising a first anchor device for each side of the vehicle, a series of rods extending over the body of the vehicle and being connected to said anchor devices, and a second anchor device having a vertical shaft for each side of the vehicle, a strap for extending over the body of the vehicle for connection with said second anchor devices, a means on said second anchor device for clamping said strap including a plurality of clamping plates, a sleeve supporting said plates and movable axially on said shaft, and means on said shaft for retaining said sleeve in an adjusted position.

3,943,671

BUILDING STRUCTURE SUPPORTED ABOVE GROUND BY A CRADLE-LIKE MEANS

William A. Curci, 4947 Fulton Drive NW., Canton, Ohio 44718

Filed Oct. 26, 1973, Ser. No. 410,195
Int. Cl.² E04B 1/344; E04H 1/12
U.S. Cl. 52—69 24 Claims



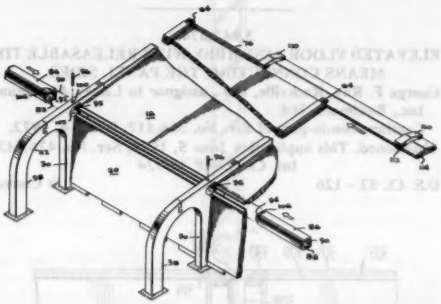
1. A building structure comprising a dwelling for human habitation, said dwelling including a complete integral, prebuilt enclosure having a peaked roof portion and a bottom portion, said roof and bottom portions having a stress and load bearing skin secured to spaced studs; said bottom having sides downwardly converging toward each other; a floor mounted inside said enclosure between said sides below the juncture of said bottom and roof portions; a pair of spaced, X-shaped support means having upper and lower portions with a crossing juncture therebetween, the upper portion of each of said support means being secured to said sides with at least the lower portions of said converging sides engaging said upper portion generally above said crossing juncture thereby providing a V-shaped cradle supporting said enclosure above and in spaced relation to the ground, each support means also having a stabilizing member connected to its lower portion, and each of said stabilizing members and said lower portions of said X-shaped support means being buried in the ground.

3,943,672

PREFABRICATED, MODULAR STRUCTURE FORMED BY LATERALLY SPACED CANTILEVER ARCH FRAME ASSEMBLIES

John H. O'Sheeran, Box 178 c/o Milwaukee Shell Corporation, Plum City, Wis. 54761

Filed Jan. 3, 1975, Ser. No. 538,256
Int. Cl.² E04B 1/32
U.S. Cl. 52—73 18 Claims



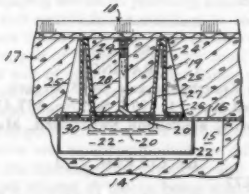
1. A prefabricated, modular building structure comprising: a plurality of laterally spaced, generally parallel cantilever arch frame assemblies, each frame assembly comprising a T-shaped vertical column member having integral inwardly and outwardly projecting arms and a base mounted to the ground, a horizontal beam member mounted to one of said arms and extending outwardly therefrom in cantilever aligned fashion and a semi-arch member fixed at its base to the ground to one side of said column member in alignment therewith, and having its upper end mounted to the other column arm, said assembly members being mounted to each other by interlocking male and female connectors formed on respective members, and at least a roof panel mounted along opposite side edges to respective horizontal beam members of adjacent frame assemblies.

3,943,673

CELLULAR FLOOR, WALL OR THE LIKE STRUCTURE

Harold T. Lindahl, San Francisco, Calif., and Theodore Maggos, New York, N.Y., assignors to IS Incorporated Systems Company, New York, N.Y. and Gershon Meckler, Bethesda, Md., part interest to each

Continuation of Ser. No. 404,005, Oct. 5, 1973, abandoned. This application Sept. 30, 1974, Ser. No. 510,552
Int. Cl.² E04B 5/48
U.S. Cl. 52—98 2 Claims



1. In a floor or the like structure including a covered raceway having a plurality of knockouts in its cover, and a monolithic floor or the like covering, and at least partially supported by the raceway, the improvement of cooperatiing piston-cylin-

der assemblies on the raceway cover, each of said assemblies comprising an outer cylinder and a filler element defining a piston therewith, overlying one of the knockouts, said piston being of such size and shape to be capable of limited axial movement within said cylinder, said piston having an end in substantial contact with one of the knockouts, said piston end being of lesser diameter than that of said cylinder end and said knockout whereby, upon limited axial movement in the direction of the raceway, said piston will drive the knockout into the raceway and enter the opening formerly occupied by the knockout, said piston expanding in cross-sectional size away from said end to a size too large to enter the knockout opening, and said piston comprising a planar section of the floor or the like of said structure.

3,943,674

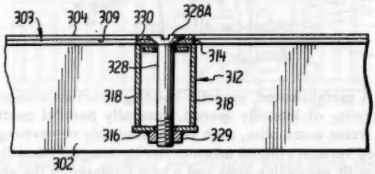
ELEVATED FLOOR ASSEMBLY WITH RELEASABLE TIE MEANS CONNECTING THE PANEL SIDES

George F. Ray, Rockville, Md., assignor to Liskey Aluminum Inc., Baltimore, Md.

Continuation-in-part of Ser. No. 306,417, Nov. 14, 1972, abandoned. This application June 5, 1974, Ser. No. 476,543

Int. Cl.² E04F *15/024*

U.S. Cl. 52—126 **9 Claims**



1. An elevated false floor assembly of panels comprising a plurality of square panels arranged side-by-side in rows and supported on pedestals at their corners to leave a plenum below said floor assembly, said panels each having sides with releasable tie means connecting neighboring sides of adjacent panels together and said tie means being located intermediate the corners of the panels, said panels being load-bearing with spaced apart upper and lower metal sheets which are joined together at the outer perimeters of said panels, at least some of said panels having a bracket with projection means at each of its sides, and said projection means comprising spaced apart vertically elongated flanges that extend between adjacent panel sides and afford load bearing supports to said panels intermediate their corners, said tie means extending through said brackets and releasably securing the sides of adjacent panels together, whereby both vertical and horizontal deflections of one panel are resisted and shared by neighboring panels, said plenum being readily accessible by disconnecting said tie means at the upper surface of said floor assembly, and said panels being liftable from surrounding assembled panels and removable.

3,943,675

GRATING

Otto Wyss, 33 Kreuzbuhlstrasse, 6045 Meggen, Switzerland

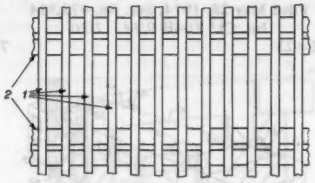
Filed Mar. 11, 1975, Ser. No. 557,436

Claims priority, application Switzerland, Mar. 12, 1974, 3457/74

Int. Cl.² E04C *2/42*

U.S. Cl. 52—177 **3 Claims**

1. A grating composed of interlocking and disassemblable longitudinal profile bars and slotted cross pieces, said cross pieces having an upper edge and intended for coverings, sheathings, etc., characterized in that the slots (3) punched in the cross pieces (2) extend from said upper edge and comprise a hollow defined by curved walls (4) at a certain distance from the upper edge (2*a*), in that the longitudinal profile bars (1) are without slots and their parts which engage in the slots of



the cross pieces (2) comprise a wall part (1*c*) which is bent to one side, the convex side of this wall part is elastically compressed and frictionally bound against the one wall (4) of the hollow of the slot (3).

3,943,676

MODULAR BUILDING WALL UNIT AND METHOD FOR MAKING SUCH UNIT

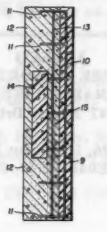
Gustav Ickes, Karlsbader Str. 1a, 6462 Gelnhausen-Haller, Germany

Filed Mar. 15, 1974, Ser. No. 451,928

Claims priority, application Germany, Dec. 24, 1973, 2364571

Int. Cl.² E04C *2/26*

U.S. Cl. 52—309 **10 Claims**



1. A modular load bearing building wall unit comprising a hard foam layer having an inner surface and an outer surface, a concrete layer intimately bonded to said inner surface of said hard foam layer, a reinforcing wire mesh mat embedded in said hard foam layer and having wire portions extending from the plane of said first mat into said concrete layer for intimately bonding said foam layer to said concrete layer, said wire mesh mat being completely covered all around by said foam layer at both sides thereof, and core elements of a material lighter than the material of said concrete layer, said core elements being completely embedded in said concrete layer.

3,943,677

ROOFING PANEL SYSTEM

Paul A. Carothers, Carmichael, Calif., assignor to Paul A. Carothers; Rodney V. Jones and Ernest H. McCoy, all of Berkeley, Calif., part interest to each

Continuation-in-part of Ser. No. 385,992, Aug. 6, 1973, abandoned. This application Aug. 5, 1974, Ser. No. 494,847

Int. Cl.² E04D *1/20, 1/36*

U.S. Cl. 52—309 **5 Claims**

1. A panel for a roofing system comprising

an elongated and generally rectangular panel plate molded of a low density organic resin foam material, said panel having a relatively thick overlay exposure portion adjacent the butt end and a relatively thin under lay headlap portion adjacent the head end, said panel being tapered in thickness from the butt end of its exposure portion to

the head end of the headlap portion and the width of the headlap portion being greater than the width of the exposure portion in overlap,

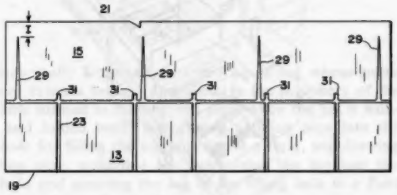
an ornamental configuration formed on the exposure portion of said panel,

a shoulder formed at the head end of the exposure portion at the junction with said headlap portion, and

a plurality of water control grooves including

a plurality of grooves extending from said shoulder to the butt end of said exposure portion,

a plurality of grooves formed in the top surface of the headlap portion of said panel with each disposed to run from an intermediate terminus on said headlap portion to said shoulder, said shoulder having a plurality of



water distributing grooves disposed in said headlap portion to run laterally across said panel adjacent said shoulder interconnecting the grooves formed in said headlap portion with the grooves in said exposure portion whereby water can run down the roof panel and then be distributed along said shoulder to further run down the panel through the grooves in said exposure portion, each of said lateral grooves extending for only a portion of the width of said panel and not interconnecting and not running to the edges of said panel whereby water can flow laterally across only a portion of said panel and not to the edges of said panel thereby preventing it from flowing along said shoulder to the gaps between the panels.

3,943,678

GAP-SEALING STRUCTURE

Kurt Ehrenberg, Dietzenbach, and Klaus Wörner, Frankfurt-Seckbach, both of Germany, assignors to Heinrich Worner Fabrik Fur Autoteile, Frankfurt, Germany

Filed Feb. 11, 1974, Ser. No. 441,623

Claims priority, application Germany, Feb. 13, 1973, 2306964

Int. Cl.² E04D 1/36

U.S. Cl. 52—461 **22 Claims**

1. In a structure comprising a pair of panels located substantially in a common plane and having juxtaposed edge portions bounded by edge faces which define with one another an elongated gap at least one rail of substantially U-shaped cross section which has an open side facing said gap and edge portions at one side of said plane, said rail having flanges extending transversely from said open side and contacting the respective edge portions, adhesive means adhesively bonding said flanges of said rail to the respective edge portion; elastically yieldable sealing strip means extending along and covering said gap and edge portions and including a sealing strip recessed in said rail; and pressure-exerting means pressing said sealing strip means into sealing engagement with said edge portions so as to seal said gap.

3,943,679

LOUVER PANEL ASSEMBLY

William K. Dissinger, Townhouse No. 71, Briarcrest Gardens, Hershey, Pa. 17033

Filed Sept. 23, 1974, Ser. No. 508,659

Int. Cl.² E06B 7/08

U.S. Cl. 52—473 **5 Claims**

1. A louver panel assembly for installation in a partition comprising

a louver panel having louver blades therein;

a first frame member;

a second frame member;

said first and second frame members having respective parallel elongated base portions with interengaging serrations for adjustably securing the first and second frame members together;

a first pair of opposed retainer flange sections of the respective first and second frame members extending substantially normal to the base portions inward for extending over an edge of the louver panel;

said first pair of opposed retainer flange sections being positioned a first distance apart for a given degree of interengagement of the frame members;

a second pair of opposed retainer flange sections of the respective first and second frame members extending outward from the base portions for extending over the partition;

said second pair of opposed retainer flange sections being positioned a second distance apart for the given degree of interengagement of the frame members and being substantially greater in width than the first pair of opposed retainer flange sections;

said interengaging serrations providing adjustment between the first and second frame members to secure different thicknesses of louver panels between the opposing faces of the first pair of retainer flange sections;

said second pair of opposed retainer flange sections being flexible and being curved inward at their distal edges toward each other such as to allow substantial flexing of the distal edges to accommodate for different thicknesses of partitions and to accommodate for different adjustments of the interengaging serrations; and

said first and second distances being selected such that during installation both distal edges of the second pair of opposed flange sections will contact the partition before both of the first pair of retainer sections contact the louver panel.

3,943,680

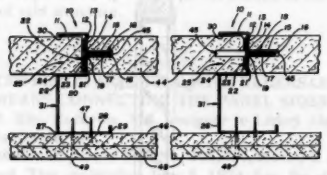
STUD HAVING KERF-ENGAGING FLANGE AND FIRE-RETARDANT WALL STRUCTURE FORMED THEREWITH

Henry A. Balinski, Hoffman Estates, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed May 27, 1975, Ser. No. 580,995

Int. Cl.² E04B 2/30, 2/78

U.S. Cl. 52—481 9 Claims



1. A stud adapted for use in constructing a wall comprised of a pair of spaced-apart coplanar layers of gypsum wallboard panels in abutting relationship having a plurality of said studs interposed between said layers of wallboard panels and affixed thereto, said stud being formed of a unitary integral sheet metal structure and comprising:

1. A first wallboard panel layer-engaging structure comprising;

a. a first flange extending to a first fold,

b. a web member connected at said first fold and extending substantially perpendicularly with respect to said first flange to a second fold,

c. a first kerf-engaging flange member connected at said second fold and extending substantially perpendicularly with respect to said first web member to a third fold,

d. a second kerf-engaging flange connected at said third fold and folded over said first kerf-engaging flange and extending to a fourth fold,

e. a second web member connected at said fourth fold and extending substantially perpendicularly with respect to said second kerf-engaging flange to a fifth fold, and

f. a second flange connected at said fifth fold and disposed substantially perpendicular to said second web member and extending to a sixth fold,

said first and second web members cooperating to define a web, said web and said first and second flanges cooperating to define a channel adapted to engage the edge of a wallboard panel of a first layer, and said first and second kerf-engaging flanges cooperating to define a kerf-engaging flange adapted to engage an adjacent wallboard panel of said first layer and cooperating with said web to restrain said panel in three directions, and,

2. means for supporting a second layer of gypsum wallboard panels spaced apart from said first layer of panels comprising:

a. a supporting web connected at said sixth fold and extending away from said second flange and terminating at a seventh fold, and

b. a wallboard-supporting panel connected at said seventh fold extending in a direction substantially parallel to and spaced-apart from said first and second flanges, said panel being adapted to permit said second layer of panels to extend across and be affixed to the outer surface thereof.

3,943,681

METHOD AND DEVICE FOR PACKAGING BOX FLATS

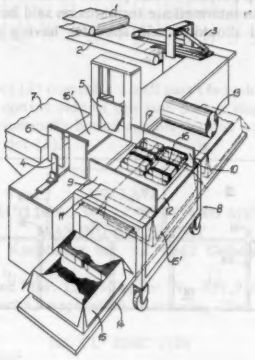
Roland Preisig, Yens, Switzerland, assignor to J. Bobst & Fils SA, Prilly, Switzerland

Filed June 20, 1974, Ser. No. 481,176

Claims priority, application Switzerland, June 29, 1973, 9497/73

Int. Cl.² B65B 5/06

U.S. Cl. 53—35 5 Claims



1. A device for packaging folded box flats comprising: a frame member, a first surface associated with said frame member for receiving a container thereon, a second surface carried by said frame member positioned vertically above the said first surface, said second surface including a movable surface portion, means for moving the surface portion to and from an area over a container on the first surface, vertical walls defining an area above said second surface, means for positioning a sheet of divider material on said movable surface portion, means for positioning packets of a plurality of individual box flats on said sheet of divider material, a movable weight positionable at a first position on said packets, means allowing said weight to freely fall from said first position to a second position adjacent the first surface, means limiting movement of said weight in a horizontal direction whereby when said movable surface portion is removed from said area, the divider material, packets and weight will fall towards the first surface, means restricting spreading of the individual flats during falling to maintain the position and alignment of the packets, and means for moving said weight to a third position above the second surface.

3,943,682

METHOD FOR MAKING, FILLING AND SEALING CONTAINERS THROUGH A RECLOSEABLE FILLING OPENING

Anders Ruben Rausing, Rome, Italy, assignor to Tetra Pak Developpement SA, Lausanne, Switzerland

Filed June 10, 1974, Ser. No. 478,088

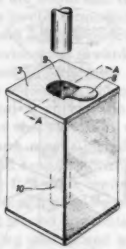
Claims priority, application Sweden, June 14, 1973, 7308364

Int. Cl.² B65B 43/00, 43/39, 1/04

U.S. Cl. 53—37 7 Claims

1. A method for making, filling and sealing packing containers for fluids in which a substantially tube-like container body of packaging material is closed at each end with an end plate of packaging material, said method comprising forming cuts in a substantially U-shaped configuration on opposed sides of one of said end plates, said cuts extending partially through the thickness of the one end plate and the cut on the outer side of the one plate lying substantially parallel to and outside the

cut on the inner side of the end plate when viewed normal to the plane of the end plate, affixing the one end plate and a second end plate to the ends of the side walls of the container body to form a closed container, withdrawing and folding back that portion of the packaging material of the one end plate generally within the limits defined by the substantially U-shaped cuts therein by tearing the uncut material between



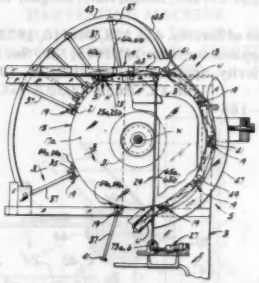
the substantially U-shaped cuts to form a lug whose outer periphery extends beyond and overlaps the periphery of the filling hole formed in the one end plate when the lug is withdrawn and folded back, introducing a filling pipe into the filling hole for filling the container with a fluid, withdrawing the filling pipe, unfolding and reinserting the lug into the filling hole and securing the lug in the filling hole in a fluid tight and mechanically durable manner.

3,943,683

PACKAGING APPARATUS

Lloyd Kovacs, Sheboygan, and Dale Mark Cherney, Howards Grove, both of Wis., assignors to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed Mar. 19, 1975, Ser. No. 559,733
Int. Cl.² B65B *57/00, 51/30*
U.S. Cl. 53—51 **7 Claims**



1. Apparatus for packaging units in flexible sheet material wherein the units are spaced longitudinally in a tube of said material and the apparatus has means for sealing the tube between the units, said sealing means comprising:

a wheel rotatable or an axis;

a series of sealing units carried by the wheel;

each sealing unit having means for coupling it to the wheel for travel therewith and adapted for uncoupling of the sealing unit from the wheel to allow the wheel to rotate while the sealing unit remains stationary;

means for arresting a first sealing unit at a hold position and for actuating its coupling means to uncouple said sealing unit from the wheel, said arresting means being movable between an operative position in which it is engageable by said coupling means of said first sealing unit to arrest said first sealing unit and to uncouple it from the wheel and a retracted position for release of the sealing unit to travel with the wheel, said arresting means being movable from its operative to its retracted position in response to a signal;

means for generating said signal in response to passage of a unit by a reference point so as to couple the first sealing unit to the wheel in timed relation to movement of the units with the tube for sealing the latter between successive units; and

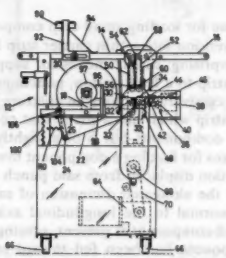
backup means for generating said signal in response to movement of said wheel through a distance greater than a predetermined distance for the units being packaged in the event said generating means fails to sense the passage of a unit by said reference point, said backup means being reset prior to generating said signal by the release of a sealing unit in response to generation of said signal by said generating means, said backup means comprising means for generating a number of pulses corresponding to the wheel moving through a unit length, and means for counting said pulses and for generating said signal upon counting a specified number of pulses corresponding to said distance greater than said predetermined distance for the units.

3,943,684

TIME DELAY FOR INTERLEAVING MACHINE

Walter E. Lotz, 74 Laureleaf Road, Thornhill, Ontario, Canada

Filed Mar. 31, 1975, Ser. No. 563,484
Int. Cl.² B65B *57/02*
U.S. Cl. 53—66 **8 Claims**



1. Apparatus for feeding separate pieces of sheet material from a continuous supply thereof to individual articles travelling along a predetermined path and positioning a piece of sheet material under each article, said apparatus including conveying means for conveying articles sequentially along the predetermined path, means for feeding sheet material from a continuous supply thereof to a cutting station, cutting means at said cutting station operable by an electrical actuating circuit to cut pieces of sheet material from said continuous supply means for feeding said pieces of sheet material from said cutting station to said conveying means for entrainment between the underside of an article and said conveying means at a material positioning station, article sensing means adjacent said predetermined path before said material positioning station operable to sense the presence of an article passing said sensing means, feeding and cutting control means actuated by said article sensing means to cause the feed of sheet material to said cutting station to be commenced when said sensing means senses an article passing thereby and to be stopped when said sensing means senses that the article has passed thereby, said control means including a set electrical time delay device actuated by said article sensing means to set said electrical actuating circuit when an article is sensed by said article sensing means, said article sensing means ceasing actuation of said time delay device when said article has passed by said article sensing means, and said time delay

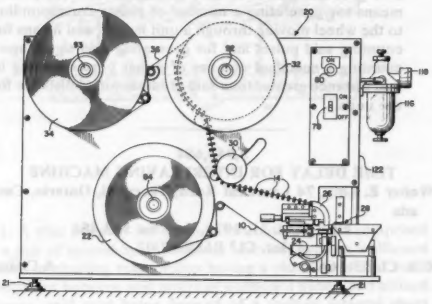
device operating to cause said electrical actuating circuit to operate said cutting means to cut a piece of sheet material from the continuous supply a predetermined time after said sensing means ceases to actuate said control means to stop said feed means, the time delay being predetermined to ensure that feed of sheet material has actually stopped before said cutting means operates.

3,943,685

MACHINE FOR LOADING ELECTRIC COMPONENTS INTO A CARRIER STRIP

Charles C. Rayburn, Mount Prospect, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed July 19, 1974, Ser. No. 489,963
Int. Cl.² B65B 57/12
U.S. Cl. 53—73 **4 Claims**



1. A machine for loading small chip components having an elongated dimension into a thin carrier strip having a longitudinal axis comprising: supply means for supplying successive areas of said strip to a feed station, punch means at said feed station for successively punching an aperture into each of said areas of said strip which has a shape that corresponds to the shape of said components but is of a slightly smaller dimension, feed means for feeding a component towards said carrier strip at a location displaced from said punch means in a manner such that the elongated dimension of said component is substantially normal to the longitudinal axis of said carrier strip when said component is present, sensing means for sensing if a component has been fed toward said carrier strip, comprising a sensing finger and a micrometer screw means with a micrometer dial for accurately locating the position of said sensing finger with respect to said fed component, indexing means, gripping means coupled to said indexing means and operated by said sensing means for gripping said carrier strip only if said sensing means senses that a component has been fed by said feed means, said indexing means undergoing a motion such that said punched aperture will be aligned with said fed component after said indexing operation and displacement means for forcing said component into said aperture after said alignment has been achieved by said indexing means.

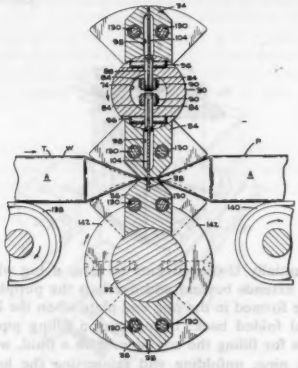
3,943,686

WRAPPING MACHINE WITH SEVERING BLADE IN CRIMPING HEAD

Donald C. Crawford, and Michael R. Nack, both of Green Bay, Wis., assignors to FMC Corporation, San Jose, Calif.

Filed Sept. 5, 1974, Ser. No. 503,944
Int. Cl.² B65B 9/06
U.S. Cl. 53—182 R **12 Claims**

9. In an article wrapping machine of the type having a frame, superposed shafts geared together and mounting opposed rotary crimping heads for crimping and sealing the wrapping between articles, means for mounting a radially movable knife blade in a slot formed in one crimping head, a blade receiving recess formed in the other crimping head, and blade actuating mechanism for moving said blade into and out of said recess to sever the wrapping between articles; the improvement wherein said blade actuating mechanism comprises means for moving said blade radially without any substantial axial motion, the cutting edge portion of said knife blade comprising a flat plate having parallel sides with a bevel formed on one side of said plate, said bevel intersection the opposite side of the plate and teeth formed in the beveled



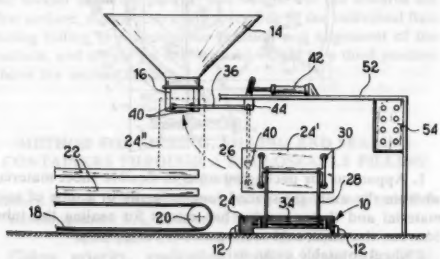
portion of the blade, said teeth having sharpened cutting edges disposed in the plane of said bevel and extending between the sides of said plate, said teeth being relieved behind said cutting edges, said sharpened cutting edges forming a sawtooth cutting edge that zig zags between the two sides of said plate for effecting progressive cutting of the web when the blade is projected into said crimping head recess for producing a zig zag severance line across the web that has the same width as the thickness of said plate.

3,943,687

APPARATUS FOR TAKING-UP AND CONVEYING BAGS

Renzo Giuseppe Cerioni, Milan, Italy, assignor to El Cu S.p.A., Italy

Continuation of Ser. No. 423,128, Dec. 10, 1973, abandoned.
This application Mar. 12, 1975, Ser. No. 557,818
Claims priority, application Italy, July 18, 1973, 26724/73
Int. Cl.² B65B 43/30
U.S. Cl. 53—188 **4 Claims**



1. Apparatus for filling empty bags comprising, in combination, a filling station including an elevated hopper having a stationary vertically oriented hopper outlet mouth; empty bag support means spaced longitudinally and laterally from said filling station at a level very substantially below said hopper outlet mouth, and adapted to support a pile of empty bags in vertically superposed horizontally oriented relation; a first sub-assembly including first arm means laterally aligned with and spaced from said empty bag support means and pivotal about a first horizontal axis located in a vertical plane inter-

secting said stationary hopper outlet mouth, bag gripping means on said first arm means spaced from the pivot axis thereof, and first actuator means operable to swing said first arm means about said first axis laterally and downwardly toward said bag support means to grip the exposed side wall of the top bag of the pile at a zone spaced from its filling mouth, and then to swing said first arm means laterally and upwardly in a circular arc about said first horizontal axis into said vertical plane at a level intermediate the levels of said bag support means and said hopper outlet mouth, with the bag filling mouth facing horizontally toward said stationary hopper outlet mouth; a second sub-assembly including second arm means pivotal about a second horizontal axis perpendicular to such vertical plane and at an elevation above said first axis substantially equal to the elevation of said hopper outlet mouth, said second arm means including a pair of opposed arms pivotal about said second horizontal axis and mounted for movement of their free ends toward and away from each other, and including second gripping means on said opposing arms spaced from said second horizontal axis, second actuator means operable to swing said second arm means from a horizontally oriented position into a vertically oriented position for engagement of said second gripping means with both side walls of the vertically oriented bag, supported by said first arm means, adjacent the bag filling mouth, and operable to swing said second arm means in a circular arc longitudinally and upwardly about said second horizontal axis toward said hopper outlet mouth, and third actuator means operable, during movement of said second arm means toward said stationary hopper outlet mouth, to separate the free ends of said pair of opposed arms to separate the opposite side walls of the bag to open the filling mouth thereof for slipping fo the bag filling mouth upwardly over the stationary hopper outlet mouth; and means operable to clamp the bag filling mouth against the outer surface of said stationary hopper outlet mouth; said stationary hopper outlet mouth being located at a distance above said empty bag support means substantially equal to the sum of the vertical motions of said two sub-assemblies.

3,943,688

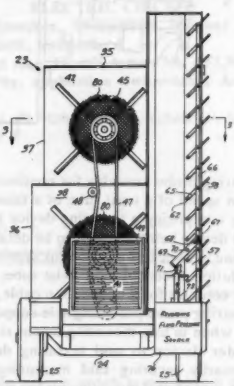
HARVESTING MACHINE

Thomas A. Billings, 3415 Elder St., Titusville, Fla. 32780

Filed Oct. 4, 1974, Ser. No. 512,137

Int. Cl.² A01D *46/00*

U.S. Cl. 56—328 R **15 Claims**



1. A harvesting machine comprising a mobile support, vertically extending housing means mounted on said support, said housing means including a laterally extending vertical air chamber having a vertically extending inner wall, laterally convergent vertical side walls extending from the side edges of said inner wall, and a laterally directed vertical discharge passage merging with said laterally convergent side walls, said housing means further including a plurality of vertically spaced air blower means communicatively connected with said vertical air chamber through said inner wall, spaced air-guiding members movably mounted in said discharge passage in a vertical array, and means to simultaneously move said air-guiding members in a manner to provide periodic intermittent laterally directed air blasts at the various levels of said vertical discharge passage, whereby to deflect the limbs of a tree as the machine is moved past the tree in proximity thereto and to cause fruit on said limbs to become detached from the limbs.

3,943,689

METHOD OF AND APPARATUS FOR TWISTING YARN OR THREAD

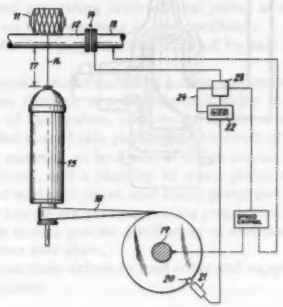
Albert Kunz, and Helmut Kullmann, both of Arbon, Switzerland, assignors to HAMEL Projektierungs- und Verwaltungs-AG., Horn, Thurgau, Switzerland

Filed Oct. 10, 1972, Ser. No. 296,176

Claims priority, application Germany, Oct. 7, 1971, 2150148; Sept. 14, 1972, 2245205

Int. Cl.² D01H *1/30*

U.S. Cl. 57—34 R **18 Claims**



1. In a method of operating a strand-twisting installation wherein a strand passes from a strand-supply spool to a strand-takeup spool and at one of the spools forms a twist-imparting mechanism, the improvement which comprises the steps of:

a. operating said twist-imparting mechanism to twist the strand between said spools prior to advancing the strand until the length of the strand between said spools has received a predetermined number of twists;

b. advancing said strand between said spools;

c. synchronously driving said spools with said strand advancing between them while operating said mechanism to twist the advancing strand only upon the generation of said predetermined number of twists in said strand:

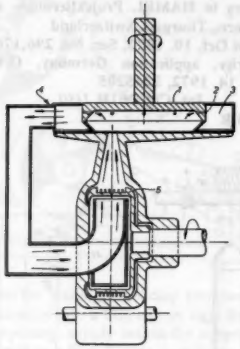
d. counting the number of turns of said mechanism and registering the counted number of turns prior to advance of the strand the number of turns imparted to said strand between said spools, said spools being coupled for synchronous operation only upon the registered count attaining a predetermined value; and reducing the speed of said mechanism in response to the registered count prior to coupling said spools for synchronous operation.

6. A strand-twisting apparatus comprising a strand-supply spool and a strand-takeup spool, one of said spools forming a twist-generating mechanism; means for driving said twist-generating mechanism; a counter responsive to the number of twists produced by said twist-generating mechanism; and means connected to said counter and synchronously connecting said spools for joint operation to advance said strand between them only upon the attainment of a predetermined count.

3,943,690
YARN SPINNING APPARATUS

John Michael Noguera, 1 Greville House, Kinnerton St., London, S.W. 1, England

Filed Sept. 20, 1974, Ser. No. 567,984
Claims priority, application United Kingdom, Sept. 21, 1973, 44501/73; Mar. 1, 1974, 9479/74
Int. Cl.² D01H 1/12
U.S. Cl. 57—58.89 7 Claims



1. An open end yarn spinning apparatus comprising in combination:

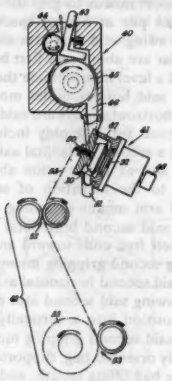
a hollow cylindrical opening roller adapted to feed fibres to a fibre collecting surface having the peripheral wall thereof formed such as to permit gaseous flow from inside the roller to outside the roller; and impeller means rotatable with the apparatus for producing a positive gas pressure within said roller during operation of the apparatus to cause a gaseous flow to pass from inside the roller to outside the roller through said peripheral wall.

3,943,691
OPEN-END SPINNING APPARATUS

Eric Mizon, Rossendale, and Hugh Moores, Oswaldtwistle, both of England, assignors to Platt International Limited, England

Filed Jan. 23, 1975, Ser. No. 543,302
Int. Cl.² D01H 1/12
U.S. Cl. 57—58.89 6 Claims

1. An open-end spinning machine comprising fibre feed means, yarn delivery means, a rotatable rotor formed by deformation of sheet metal, first and second portions of the rotor which converge to a region of maximum diameter, an interior fibre collecting surface formed at the region of maximum diameter on which discrete fibres are continuously deposited by the fibre feed means and from which the tail end of a yarn is continuously drawn off by the yarn delivery means whereby the sheet metal interior fibre collecting surface of the rotor is

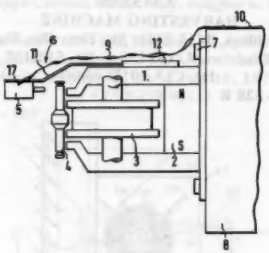


smooth and free from surface imperfections which would adversely affect the operation of the rotor.

3,943,692
MOUNTING ASSEMBLY FOR MEASURING PROBE ON FALSE-TWIST MACHINES

Peter Dosch, Jona, and Dieter Dorsch, Ebnat-Kappel, both of Switzerland, assignors to APAG Apparatebau AG, Switzerland

Filed May 20, 1974, Ser. No. 471,794
Int. Cl.² D01H 13/32
U.S. Cl. 57—77.45 5 Claims

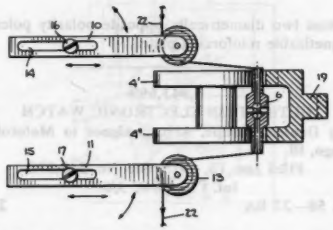


1. A measuring probe assembly for continuously measuring the revolution speed of a twist tube of a false-twist machine, said assembly comprising a texturing device including a twist tube and said device being adapted to be detachably mounted on the machine, a measuring probe for continuously measuring the revolution speed of said twist tube, said measuring probe having contacts for a connection cable, a holder device for said measuring probe providing sole support for said measuring probe when in use, mounting means stationarily securing said holder device to said texturing device, mounting means stationarily securing said measuring probe to said holder device, one of said mounting means providing for rapid separation and reconnection of said measuring probe with respect to said texturing device, a flexible connection cable for connecting said measuring probe to a display device, one end of said cable being fixed permanently to said contacts and means for securing said cable along a length thereof to the machine.

3,943,693
APPARATUS FOR FALSE-TWIST TEXTURING OF TEXTILE YARNS

Josef Raschle, Butschwil, Switzerland, assignor to Heberlein Maschinenfabrik AG., Wattwil, Switzerland

Filed Sept. 27, 1974, Ser. No. 509,953
Claims priority, application Switzerland, Oct. 1, 1973, 14046/73; Mar. 8, 1974, 3264/74; July 26, 1974, 10284/74; July 26, 1974, 10285/74
Int. Cl.² D02G 1/02, 1/04
U.S. Cl. 57—77.45 19 Claims

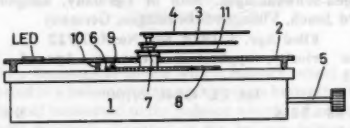


1. Device for false-twist texturing of yarns, comprising two axially parallel rollers which are rotatable about their respective axes and at least one twist tube supported within a throat formed by the rollers and in tangential contact therewith, driving means for simultaneously driving the two rollers, yarn deviating means for feeding the yarn to the twist tube and removing it from the same at a predetermined angle so that the twist tube is pressed against the rollers by means of the force of the yarn tension and means for maintaining the position of the twist tube relative to the rollers when no yarn is present in the twist tube.

3,943,694
DIVERS' FLUID-TIGHT WATCH COMPRISING AN ELECTRIC CIRCUIT

Peter Hofer, Grenchen, Switzerland, assignor to ETA A.G. Ebauches-Fabrik, Switzerland

Filed Aug. 16, 1974, Ser. No. 497,942
Claims priority, application Switzerland, Aug. 30, 1973, 12461/73
Int. Cl.² G04C 21/16; G04B 19/30
U.S. Cl. 58—19 C 6 Claims

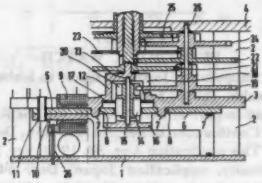


1. A fluid-tight diver's watch comprising a movement, an electric circuit, an electroluminescent diode connected into said circuit, and switching means in said circuit and accessible from outside said watch, wherein said circuit comprises a switch which is controlled by the movement of said watch and which is adjustable so as to cause said illuminating member to be switched on at a predetermined moment.

3,943,695
QUARTZ CRYSTAL CONTROLLED TIMEKEEPING APPARATUS

Manfred Bauer; Herbert Kroesche; Roland Sauter, and Helmut Stechmann, all of Schwenningen, Germany, assignors to Kienzle Uhrenfabriken GmbH, Schwennigen, Germany

Filed Feb. 15, 1974, Ser. No. 442,940
Claims priority, application Germany, Feb. 19, 1973, 2308057; Feb. 19, 1973, 2308058
Int. Cl.² G04C 3/00; G04B 13/02
U.S. Cl. 58—23 D 19 Claims

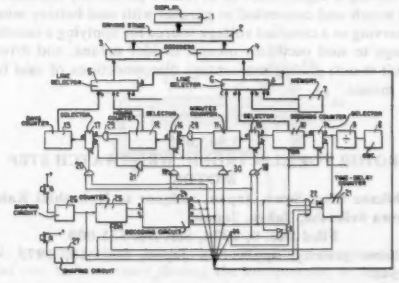


1. Crystal-controlled time-keeping apparatus comprising:
a crystal oscillator;
an electric frequency divider circuit coupled to said oscillator and generating bi-directional pulses at a rate dependent on the frequency of said oscillator;
a bi-polar stepping motor controlled by said bidirectional pulses;
said stepping motor including a drive coil and a rotor which rotates through a predetermined angle in response to each of said pulses, said motor further comprising two parallel spaced side plates of a non-conductive non-magnetic material, at least one of which carries a bearing for said rotor, and a plurality of stator plates supported on one of said side plates, said stator plates and said one side plate having cooperating mating projections and recesses which ensure precise positioning of said stator plates on said one side plate,
and a gear train driven by said rotor and supported on said side plates.

3,943,696
CONTROL DEVICE FOR SETTING A TIMEPIECE

Hubert Portmann; Eric Saurer, both of Hauterive, and Pierre Hersberger, Neuchatel, all of Switzerland, assignors to Ebauches S.A., Neuchatel, Switzerland

Filed July 2, 1974, Ser. No. 485,107
Claims priority, application Switzerland, July 13, 1973, 10216/73
Int. Cl.² G04B 27/08
U.S. Cl. 58—23 R 6 Claims



1. An electronic timepiece comprising a time-keeping circuit having serially connected counters for generating day,

hour, minute, and second signals; a four-digit display connected to said counters; selecting means coupled to said counters and having one mode for the display of two units of real time, and a plurality of other modes for the selection and display of each single unit of time for correction; first switch means connected to said selecting means and actuable to sequentially advance said selecting means from one mode to another; and second switch means coupled to said selecting means for causing the display of a different two units of real time when said selecting means is in said one mode, and for correcting said selected single unit of time when said selecting means is in one of said other modes.

3,943,697

ELECTRONIC WATCH

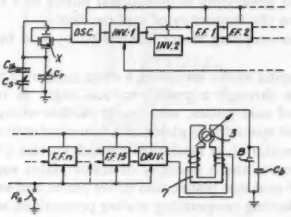
Kinji Fujita, Shimosuwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 398,914, Sept. 24, 1973, abandoned, Continuation of Ser. No. 207,256, Dec. 13, 1971, abandoned. This application Aug. 30, 1974, Ser. No. 502,134

Claims priority, application Japan, Dec. 14, 1970, 45-110795; United Kingdom, Nov. 19, 1971, 53891/71

Int. Cl.² G04C *3/00*

U.S. Cl. 58—23 BA **1 Claim**



1. An electronic watch comprising time standard oscillator means for producing a high frequency signal; electronic divider means coupled to said standard oscillator means for dividing said high frequency signal into low frequency timing signals having a period of one second; driving circuit means operatively coupled to said divider means for receiving said one second timing signals and producing one second motor driving signals; pulse motor means operating at peak currents of at least 300 μ amps and including driving coil means electrically coupled to said driving circuit means for receiving said motor driving signals; a button battery releasably mounted in said watch and operatively coupled to said oscillator means, divider means and driving circuit means for driving same by applying thereto a substantially constant voltage; and a capacitor having a capacitance of at least 1 μF fixedly mounted in said watch and connected in parallel with said battery means for serving as a constant voltage source for applying a constant voltage to said oscillator means, divider means, and driving circuit means during momentary disconnections of said battery means.

3,943,698

ROTOR FOR ELECTRONIC WRISTWATCH STEP MOTOR

Yoshikazu Ono, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

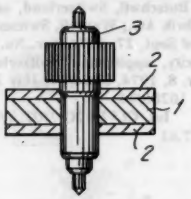
Filed Dec. 9, 1974, Ser. No. 531,009

Claims priority, application Japan, Dec. 10, 1973, 48-137545

Int. Cl.² G04C *3/00*; H02K *21/12*

U.S. Cl. 58—23 D **9 Claims**

1. A rotor construction for an electronic wristwatch step motor comprising a rotor pinion and a high performance permanent magnet rotor mounted thereto, said permanent magnet rotor including a brittle permanent magnet core defining at least two diametrically opposite polarity poles and a nonmagnetizable reinforcing plate.



3,943,699

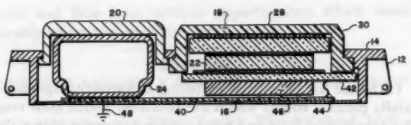
ULTRA THIN ELECTRONIC WATCH

R. Gary Daniels, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Jan. 13, 1975, Ser. No. 540,370

Int. Cl.² G04C *3/00*

U.S. Cl. 58—23 BA **2 Claims**



1. An electronic watch comprising:
a battery,
a display element,
electrical circuit means operatively connecting said battery and said display element,
a case having top and bottom surfaces at least generally parallel to each other, the distance between the top and bottom surfaces defining a body thickness for said watch, said case having first and second adjacent portions thereof extending above the top surface, said battery extending at least in part into the first portion of said case extending above the top surface, and said display element extending at least in part into the second portion of said case extending above the top surface, and, wherein said first portion of the case extending above the top surface thereof is removable to allow access to said battery.

3,943,700

LARGE-SIZED CLOCKWORK WITH AN ELECTRICALLY DRIVEN STRIKING TRAIN

Herbert Hummel, Niedereschach, and Hansrichard Schulz, Villingen-Schwenningen, both of Germany, assignors to Erhard Jauch, Villingen-Schenningen, Germany

Filed Apr. 3, 1974, Ser. No. 457,722

Claims priority, application Germany, Apr. 4, 1973, 2316833

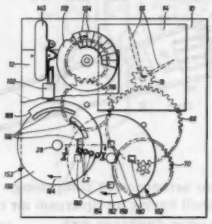
Int. Cl.² G04C *21/00*

U.S. Cl. 58—38 A **9 Claims**

1. A clockwork comprising:
a clock movement for measuring time;
a striking train for sounding the time at preselected times;
an electric drive mechanism for driving said striking train;
control means for activating said drive mechanism at said preselected times and deactivating said drive, mechanism at the end of the striking period; said control means comprising:
a first wheel for selecting said preselected times, said first wheel being driven by said clock movement and having

cut-outs radially spaced in staggered relationship such that each radial distance from the axis of said first wheel contains only one cut-out, said first wheel cut-outs being angularly spaced to correspond to said preselected times;

a second wheel for selecting the length of said striking period, said second wheel being driven by said drive mechanism and having cut-outs radially spaced in staggered relationship such that each radial distance from the axis of said second wheel contains only one cut-out, each of said second wheel cut-outs having a length in a peripheral direction corresponding to its respective said length of said striking period and each end of each of said sec-



ond wheel cut-outs slightly angularly overlapping one end of another of said second wheel cut-outs;

said first and second wheels being mounted on parallel axes to mutually overlap in paired relationship the movement path of said cut-outs of said first and second wheels;

electrical sensing means including cooperating sensing elements located on opposite sides of said first and second wheels proximate said movement path overlaps; and

drive circuit means responsive to said sensing elements to activate said drive mechanism when said paired cut-outs overlap and to deactivate said drive mechanism when said paired cut-outs do not overlap.

3,943,701

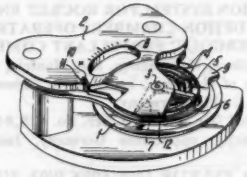
REGULATOR AND BALANCE BRIDGE ARRANGEMENT FOR A HOROLOGICAL DEVICE

Claude Louis Poix, Besancon, France, assignor to Timex Corporation, Waterbury, Conn.

Filed Jan. 8, 1975, Ser. No. 539,480

Int. Cl.² G04B *17/14, 17/32*

U.S. Cl. 58—109 **5 Claims**



1. In a horological device with a balance wheel pivotably supported in a balance bridge and having a hairspring with one end thereof connected to the balance wheel and an adjustable regulator pivotably mounted on the balance bridge, the improvement comprising:

a regulator arm moveable relative to said bridge defining a regulator slot for holding the hairspring, said slot being open toward said balance bridge,

a first bridge portion providing a pinning slot for receiving the other end of the hairspring, and

a second bridge portion extending over an arcuate section of the hairspring and adapted to close off the open end of said regulator slot over the entire setting range of the regulator to prevent disengagement of the hairspring.

3,943,702

APPARATUS FOR THE CONTINUOUS PRODUCTION OF LINK CHAINS

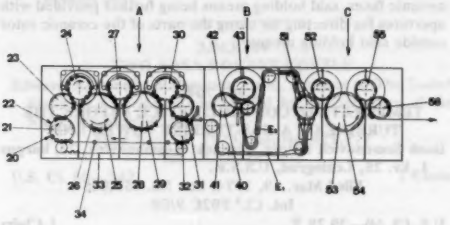
Jean-Francois Lacombe-Allard, Sens (Yonne), France, assignor to Automatisme & Technique, Arcueil (Val de Marne), France

Filed Nov. 21, 1974, Ser. No. 525,893

Claims priority, application France, Dec. 5, 1973, 73.43521

Int. Cl.² B21L *9/02*

U.S. Cl. 59—4 **9 Claims**



1. Apparatus for the continuous production of chains comprising a first machine composed of a plurality of cooperating cylinders having at least one work station around the periphery of each cylinder capable of performing a step in the manufacture of inner links, a second machine composed of a plurality of cooperating cylinders having at least one work station around the periphery of each cylinder capable of performing a step in the manufacture of outer link blanks, a third machine composed of a plurality of cooperating cylinders having at least one work station around the periphery of each cylinder capable of performing a step in completing the manufacture of outer links from said outer link blanks after joining said outer link blanks to said inner links to form a chain, first transfer means for transferring said inner links from said first machine to said third machine, and second transfer means for transferring said outer link blanks from said second machine to said third machine, all of said machines and transfer means operating in a constant, continuous manner.

3,943,703

COOLING PASSAGES THROUGH RESILIENT CLAMPING MEMBERS IN A GAS TURBINE POWER PLANT

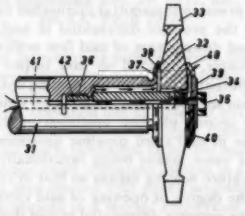
Sven Olof Kronogard, Lomma, Sweden, assignor to United Turbine AB and Co., Kommanditbolag, Malmo, Sweden

Filed May 17, 1974, Ser. No. 471,176

Claims priority, application Sweden, May 22, 1973, 7307153

Int. Cl.² F02C *7/20;* **F02G** *3/00;* **F01D** *5/08*

U.S. Cl. 60—39.16 R **5 Claims**



1. In a gas turbine power plant including a compressor, at least one turbine rotor driving the compressor, at least one further turbine rotor, downstream of the compressor driving turbine, delivering external power, at least one combustion chamber communicating with the compressor and providing combustion gases to the turbine rotors, the improvement comprising a hollow metal shaft, the compressor driving tur-

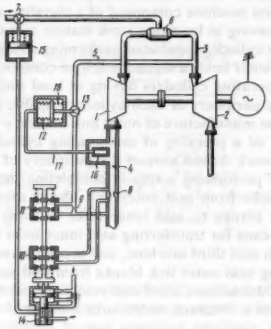
bine rotor, located closest to the combustion chamber including a disc having integral vanes along its periphery, said rotor being formed of ceramic material, means resiliently deformable in a radial as well as an axial direction with respect to thermal movement enclosing a portion of said ceramic disc for centering and holding the same with respect to the hollow metal shaft, passage means for conveying air from the compressor to the hollow metal shaft, and said centering and holding means, forming extensions of the air passage through said hollow shaft between themselves and the juxtaposed ceramic faces, said holding means being further provided with apertures for directing air along the parts of the ceramic rotor outside said holding means.

3,943,704

TEMPERATURE CONTROL DEVICE BEFORE THE TURBINE OF A GAS-TURBINE POWER UNIT

Isaak Semenovich Ratner, prospekt Kosmonavtov, 23, korpus 1, kv. 25, Leningrad, U.S.S.R.

Filed Mar. 19, 1974, Ser. No. 453,005
Int. Cl.² F02C 9/08
U.S. Cl. 60—39.28 T **1 Claim**



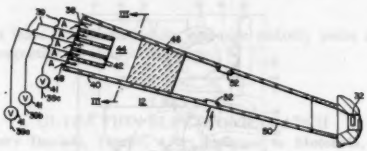
1. In a gas turbine unit including a compressor; a turbine installed downstream of said compressor; a first pipeline connected to the inlet side of said turbine; a second pipeline provided upstream of said compressor; a third pipeline connecting said first and said second pipelines; a combustion chamber installed between the compressor outlet side and the inlet side of the turbine and communicating therewith; a means for feeding fuel to said combustion chamber; means for controlling the supply of fuel to said combustion chamber; a temperature control device for said turbine; said temperature control device comprising: a first orifice mounted in said second pipeline; a second orifice mounted in said third pipeline; a first pressure transmitter connected to said first orifice for sensing the pressure differential in said second pipeline upstream and downstream of said first orifice; a second pressure transmitter connected to said orifice for sensing the pressure differential in said third pipeline upstream and downstream of said second orifice; a means for sensing the temperature in the second pipeline upstream of the compressor; a valve means in said third pipeline upstream of said second orifice, said valve means being functionally associated with said temperature sensing means so that in response thereto a change in the degree of opening of said valve means causes a change in the pressure differential in said third pipeline at said second orifice, said second pressure transmitter thereby generating the output signal whose value is a function of the position change experienced by said valve means; a means connected to the first and the second transmitters for adding up the signals produced by said transmitters; an actuating member connected to the means for adding up the signals and functionally associated with said means for controlling the supply of fuel to the combustion chamber to cause a change in the fuel supply in order to limit the temperature of the gas entering the turbine.

3,943,705

WIDE RANGE CATALYTIC COMBUSTOR

Serafino M. DeCorso, Media, and Paul W. Pillsbury, Wallingford, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 15, 1974, Ser. No. 524,292
Int. Cl.² F02C 7/22
U.S. Cl. 60—39.74 R **3 Claims**



1. A combustor arrangement comprising:
a combustor shell having an upstream air receiving portion and a combustor discharge end;
a catalytic reactor member disposed within said shell intermediate said upstream portion and said discharge end;
a plurality of coaxial tubular passageways extending from adjacent said upstream portion to generally adjacent said catalytic reactor member, said passageways providing airflow communications therebetween;
means for injecting fuel into each passageway so as to restrict the delivery of fuel to a confined area of said catalytic reactor member generally coextensive with the adjacent area of the tubular passageway receiving the fuel;
valve means for selectively regulating the flow of fuel to the injecting means to thereby supply fuel to any of said passageways and associated coextensive coaxial areas of catalytic reactor member;
whereby, supplying fuel to the fuel injecting means of the passageway closest to, or including, the axis of said coaxial passageways exposes the minimum area of said catalytic reactor member to support combustion and supplying fuel to the fuel injecting means of all said passageways exposes the maximum area of said catalytic reactor member to support combustion.

3,943,706

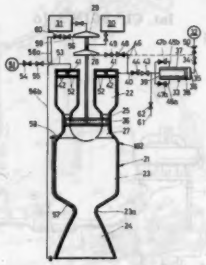
IGNITION SYSTEM FOR ROCKET ENGINE COMBUSTION CHAMBERS OPERATED BY NON-HYPERGOLIC PROPELLANT COMPONENTS

Franz Grafwallner, Holzkirchen, and Manfred Schutz, Ottobrunn, both of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Germany

Filed Dec. 27, 1973, Ser. No. 428,840
Claims priority, application Germany, Jan. 10, 1973, 2300983
Int. Cl.² F23R 1/00; F02K 9/02, 3/10
U.S. Cl. 60—204 **5 Claims**

4. A method of igniting a rocket engine of the main stream type which includes a main combustion chamber and a precombustion chamber which generates one propellant component-rich gaseous products which drive a turbine in the connection between the precombustion chamber and the main combustion chamber and in which the turbine, in turn, dirves first and second propellant component pumps which are connected respectively to propellant components which are separately pumped to the precombustion chamber and to the main combustion chamber and using an igniting agent which is stored in a separate storage vessel having a sealed piston member which is movable in the vessel to discharge the igniting agent and also using first and second storage tanks of high pressure, gaseous non-hypergolic propellant components and

wherein the igniting agent is hypergolically reactive with only one of said first and second components and the high pressure gaseous components in the storage tanks are non-hypergolic, comprising upon starting of the engine connecting the second storage tank through the storage vessel for the igniting agent at a location behind the piston to move the piston to pressurize the igniting agent and to force it to said precombustion chamber while the piston maintains a separation of the second storage tank high pressure gas from the igniting agent during



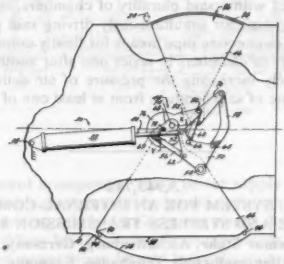
its flow into said precombustion chamber and after the igniting agent has flown out of its storage vessel directing the high pressure gaseous propellant component from said first storage tank into said precombustion chamber to effect ignition thereof hypergolically with said igniting agent and subsequently adding said first and second propellant components to said precombustion chambers by delivery thereof by the pumps driven by said turbines to complete the combustion operation.

3,943,707

GAS TURBINE ENGINE EXHAUST NOZZLE DIVERTER VALVE

Dudley O. Nash, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Oct. 23, 1974, Ser. No. 517,217
Int. Cl.[2] F02K *1/00, 1/20;* **B64C** *15/04*
U.S. Cl. 60—229 **14 Claims**



1. In a gas turbine engine exhaust nozzle comprising a flow path having an inlet and at least two exhaust ports, an improved diverter valve to selectively direct the motive fluid stream through one of said nozzle exhaust ports, and to provide improved sealing to prevent the flow of fluid through said other nozzle exhaust port, said diverter valve comprising:

first and second blocking means disposed within said nozzle;

an actuator having a translating actuator arm; and

linkage means for operatively connecting said actuator arm to said first and second blocking means, said linkage means adapted to convert the translating stroke of said actuator arm into motion to simultaneously:

retract and disengage said first blocking means from a sealing surface about the first nozzle exhaust port and thereafter rotate said first blocking means to a deployed position at least partially blocking the second exhaust port; and

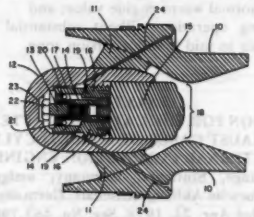
rotate said second blocking means from a stowed position in essentially coaxial spacial relationship with said nozzle flow path and essentially diametrically opposed to said first blocking means to a deployed position whereat it cooperates with said first blocking means to substantially prohibit the flow of motive fluid through the second exhaust port.

3,943,708

TWO AREA ROCKET NOZZLE

Edward A. Panella, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 26, 1973, Ser. No. 419,177
Int. Cl.[2] F02K *1/08*
U.S. Cl. 60—242 **1 Claim**



1. A device for exerting influence over the thrust of a rocket while the rocket is in flight, said device comprising:

a. a housing suspended within the combustion chamber of said rocket just forward of the nozzle throat of said rocket;

b. an explosive bolt mounted within said housing;

c. a pintle mounted on said explosive bolt in a manner such that when said explosive bolt is exploded said pintle will be released and move rearwardly into the nozzle throat of said rocket; and

d. means for exploding said explosive bolt at a desirable time.

3,943,709

SUBSTOICHIOMETRIC AIR ADDITION TO FIRST STAGE OF DUAL CATALYST SYSTEM

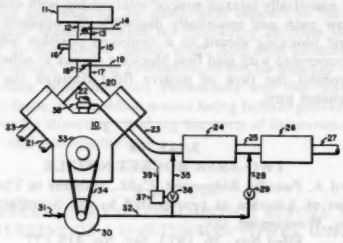
Eugene L. Holt, Elmhurst, N.Y., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 217,367, Jan. 12, 1972, abandoned. This application Dec. 29, 1972, Ser. No. 319,842
Int. Cl.[2] F02B *75/10*
U.S. Cl. 60—274 **6 Claims**

1. In a method for removing pollutants from the exhaust gas of an internal combustion engine in which fuel is burned with air at a substantially less than stoichiometric air-fuel ratio during cold engine operation and at a greater but substoichiometric air-fuel ratio during warm engine operation and in which the exhaust gas is contacted under net reducing conditions with a nitrogen oxide reduction catalyst in a first conversion zone and is then treated with added secondary air under net oxidizing conditions in a second conversion zone to oxidize carbon monoxide and hydrocarbons, the improvement which comprises:

a. supplying a quantity of primary air not greater than stoichiometric to said first conversion zone and a further quantity of secondary air at least stoichiometrically equivalent to the amount of CO present, to said second

conversion zone, said primary air being supplied during cold engine operation and said secondary air being supplied at all times during operation of the engine;



b. shutting off the supply of primary air to said first conversion zone when the average air-fuel ratio reaches substantially its normal warm engine value; and

c. continuing operation without substantial addition of external air to said first conversion zone.

3,943,710

INSTALLATION FOR THE CATALYTIC AFTERBURNING OF EXHAUST GASES OF A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

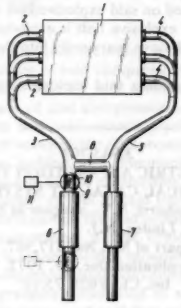
Karlheinz Lange, Stuttgart, Germany, assignor to Dr. Ing.h.c.F. Porsche Aktiengesellschaft, Germany

Filed Apr. 24, 1974, Ser. No. 463,798

Claims priority, application Germany, May 2, 1973, 2322057

Int. Cl.² F02B *75/10*

U.S. Cl. 60—288 **11 Claims**



1. An installation for the catalytic afterburning of exhaust gases of a multi-cylinder internal combustion engine having two cylinder rows with two exhaust gas lines, each of which includes at least one catalyst means, coordinated to each cylinder row and communicating with each other only downstream of the cylinder rows, characterized by temperature-responsive means operable during engine start-up to conduct substantially the entire exhaust gas flow from the internal combustion engine during warmup for a predetermined time by way of only one of the two catalyst means and then after a short period of time to conduct the exhaust gas flow from each row of cylinders by way of its associated gas line and catalyst means.

3,943,711

MULTI-STAGE AIR PUMP FOR SUPPLYING SECONDARY AIR INTO AN EXHAUST GAS PURIFICATION SYSTEM

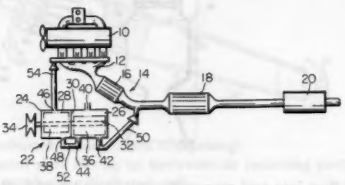
Shin-ichi Nagumo; Yasuo Nakajima, both of Yokosuka; Yoshimasa Hayashi, and Kunihiko Sugihara, both of Yokohama, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Apr. 12, 1974, Ser. No. 460,471

Claims priority, application Japan, Apr. 13, 1973, 48-43681[U]

Int. Cl.² F01N *3/16*

U.S. Cl. 60—301 **2 Claims**



1. An exhaust purifying system for an automotive internal combustion engine having an exhaust system, comprising:

a plurality of exhaust purifying devices disposed in the exhaust system, the exhaust system having a plurality of portions which are subjected to various back pressures of the exhaust gases from the engine due to the flow resistance by said exhaust purifying devices;

a multi-stage air pump for supplying secondary air required by said exhaust purifying devices, including a housing defining a chamber therein, partition means for separating said chamber into a plurality of chambers which are adjacent to each other, said plurality of chambers being communicated with said plurality of portions through a plurality of conduits, respectively, a plurality of rotors disposed within said plurality of chambers, respectively, a drive shaft for simultaneously driving said plurality of rotors, connecting pipe means for fluidly connecting said plurality of chambers in series one after another for progressively increasing the pressure of air delivered to at least one of said conduits from at least one of said chambers.

3,943,712

CONTROL SYSTEM FOR AN INTERNAL-COMBUSTION ENGINE AND STEPLESS TRANSMISSION SYSTEM

Hans-Waldemar Stuhr, Aschaffenburg, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed July 16, 1974, Ser. No. 488,928

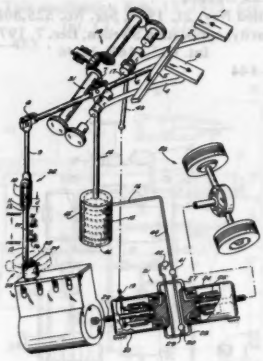
Claims priority, application Germany, Aug. 13, 1973, 2340937

Int. Cl.² F16H *39/46*

U.S. Cl. 60—327 **9 Claims**

9. A method of operating a drive system wherein a combustion engine having an engine control element capable of varying the engine speed up to a predetermined maximum speed, drives the input of a continuously variable transmission having a control element for a transmission speed ratio, the transmission having an output connected to a load and the control elements being linked by a lever to increase and decrease engine speed and torque at said output, the improvement

which comprises controlling the relationship between the variation in speed of said engine and the change in torque at



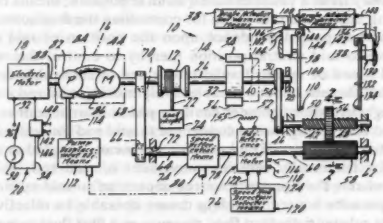
said output by shifting the fulcrum of said lever along the lever.

3,943,713

CONTROL ARRANGEMENT

Erlen B. Walton, Farmington, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 25, 1974, Ser. No. 526,774
Int. Cl.² F16H *39/46*; F15B *20/00*
U.S. Cl. 60—395 **11 Claims**



1. A control arrangement for a power supply system employing variable displacement hydraulic pump means, a prime mover for driving said hydraulic pump means, hydraulic motor means driven by said hydraulic pump means, and power transmission means driven by said hydraulic motor means, the control arrangement comprising:

first shaft means rotatable at a first angular velocity directly related to the speed at which said power transmission means is driven by said hydraulic motor means;

second shaft means rotatable at a second angular velocity directly related to a desired speed at which said power transmission means is to be driven by said hydraulic motor means;

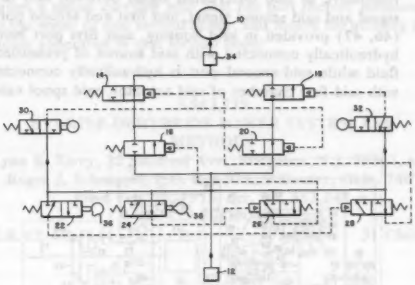
differential gearing means for comparing said first and second angular velocities wherein said first shaft means is operatively connected to said differential gearing means to provide a first rotatable input into said differential gearing means and wherein said second shaft means is operatively connected to said differential gearing means to provide a second rotatable input into said differential gearing means, and wherein said differential gearing means further comprises at least one output means effective for producing an output signal thereupon which is the algebraic summation of said first and second rotatable inputs; and means effective for varying the displacement of said variable displacement pump means in accordance with said output signal.

3,943,714

FAIL-SAFE LIMIT SWITCH STOPPING SYSTEM FOR AIR MOTOR

Ralph W. Reinker, San Jose, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 23, 1975, Ser. No. 543,612
Int. Cl.² F15B *20/00*
U.S. Cl. 60—403 **4 Claims**



1. In a pneumatic powered which system, a control circuit comprising:

a source of pneumatic fluid;

pneumatic power fluid and pneumatic control fluid supplies derived from said source of pneumatic fluid;

a pneumatic motor operated by said pneumatic power fluid;

pneumatic limit switches operated by said pneumatic control fluid which limit the operation of the winch;

and means responsive to a lack of pneumatic control fluid which stop the operation of the winch;

said means comprising normally closed valves placed in the pneumatic power fluid lines.

3,943,715

SERVO MECHANISM

Takayuki Miyao; Hiroaki Maeda, both of Toyota, and Masanori Sato, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed July 26, 1973, Ser. No. 382,911
Claims priority, application Japan, July 28, 1972, 47-076203
Int. Cl.² F02B *41/00*
U.S. Cl. 60—431 **8 Claims**

1. In a power system comprising a prime mover (**10**), including a controllable transmission member (**18***a*), and a means (**11**) for generating a first signal indicative of the power required of said prime mover, a servo mechanism (**13**) comprising:

a source of pressurized fluid (**72**);

a reservoir (**73**);

an actuator (**30**) including a housing having a bore (**35**) therein and a piston (**36**) slidably disposed within said bore so as to thereby define first (**37**) and second (**38**) hydraulic chambers within said housing, said piston hav-

ing large and small hydraulic pressure receiving areas (40, 41) which are exposed to said first and second chambers, respectively, and being connected to said controllable transmission member;

means (75) for generating a second signal indicative of the actual speed of said prime mover;

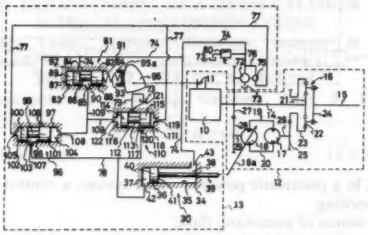
a first passage means (74, 43) for connecting said source of pressurized fluid to said second chamber of said actuator;

a second passage means (74, 53, 78, 42) for connecting said source of pressurized fluid to said first chamber of said actuator;

a first spool valve means (31) disposed within said second passage means for controlling the hydraulic communication therethrough;

means for transmitting said first and second signals to said first spool valve means, whereby a differential signal thereto is provided, said first spool valve means being responsive to said differential signal between said first signal and said second signal;

said first spool valve means (31) having a housing (44), a spool valve (49) slidably fitted within said housing and responsive to said differential signal between said first signal and said second signal, and first and second ports (46, 47) provided in said housing, said first port being hydraulically connected with said source of pressurized fluid while said second port is hydraulically connected with said first chamber of said actuator, said spool valve being movable to control the flow of pressurized fluid from said first port to said second port;



a third passage means (79, 61, 60, 42) for connecting said first chamber of said actuator to said reservoir;

a second spool valve means (32) disposed within said third passage means and having a housing (58), a spool valve (63) slidably fitted within said housing being responsive to said differential signal for controlling the hydraulic communication between said first chamber of said actuator and said reservoir, and first and second ports (61, 60) provided in said housing (58), said first port being hydraulically connected with said reservoir while said second port is hydraulically connected with said first hydraulic chamber of said actuator, said spool valve being movable to control the flow of pressurized fluid from said second port (60) to said first port (61);

means for transmitting said differential signal to said second spool valve means; and

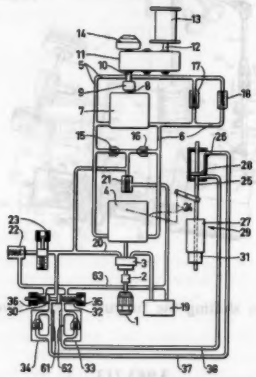
means (33) connected to said first signal generating means (11) and disposed between said first and second spool valve means (31, 32) for moving said spool valves (49, 63) of said first and second spool valve means simultaneously and in opposite directions in response to movement of said first signal generating means, whereby when one of said source of pressurized fluid and said reservoir is hydraulically connected with said first chamber of said actuator, the other of said source of pressurized fluid and said reservoir is interrupted from hydraulic connection therewith.

3,943,716

CONTROL ARRANGEMENT, PREFERABLY FOR REMOTE CONTROLLED, HYDROSTATICALLY OPERATED HOIST MACHINERIES

Rune Andersson, Vasteras, Sweden, assignor to Linden Alimak AB, Vasteras, Sweden

Filed Nov. 21, 1974, Ser. No. 525,808
Claims priority, application Sweden, Dec. 7, 1973, 7316573
Int. Cl.[2] F16H 39/46
U.S. Cl. 60—444 5 Claims

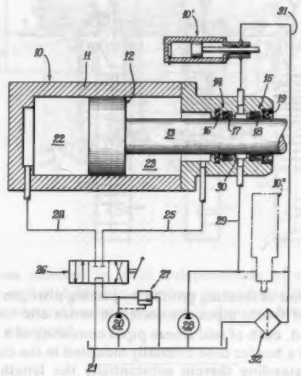


1. A hydraulic hoisting system comprising a cable drum, a hydraulic motor coupled to said drum for driving said drum, a variable displacement hydraulic pump coupled to said motor for driving said motor, and a fluid actuated control system for varying the displacement of said pump, said control system comprising a rod mounted for translational movement toward and away from a predetermined neutral position, means connecting said rod to said pump for controlling the displacement of said pump in dependence upon the position of said rod relative to said neutral position thereby to control the rotational speed of said hydraulic motor and of said cable drum coupled thereto, means for selectively moving said rod comprising a hydraulic cylinder having a piston therein connected to said rod, spring means connected to said rod for resiliently resisting movement of said rod, friction means coupled to said rod for frictionally resisting movement of said rod, and a controllable fluid pressure source connected to said cylinder, said pressure source including means operable to selectively supply substantially zero fluid pressure or a first fluid pressure in excess of said zero pressure or a second fluid pressure in excess of said first fluid pressure from said source to said cylinder, said cylinder being responsive to the continued application of said first fluid pressure to said piston to move said rod from said neutral position to an intermediate position located between said neutral position and a predetermined limit position, and said cylinder being responsive to the continued application of said second fluid pressure to said piston to move said rod from said intermediate position to said limit position, the forces imposed on said rod by said spring means and by said friction means being so related to one another and to the magnitude of said first fluid pressure that, when said rod is moving from said intermediate position toward said limit position in response to the application of said second fluid pressure to said piston, a change in fluid pressure at said piston from said second fluid pressure to said first fluid pressure when said rod is at any selected position between said intermediate and limit positions is operative to halt further movement of said piston and the rod connected thereto and to maintain said rod and piston at said selected position between said intermediate and limit positions.

3,943,717
CONTAMINANT REMOVAL FROM A HYDRAULIC CYLINDER

Lawrence F. Schexnayder, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 431,328, Jan. 7, 1974, abandoned. This application Feb. 13, 1975, Ser. No. 549,609
Int. Cl.² F15B 21/04
U.S. Cl. 60—453 7 Claims



1. A hydraulic cylinder in combination with flushing means therefor, said cylinder comprising

a housing,

a piston reciprocally mounted in said housing, and

inboard and outboard annular sealing means mounted on said housing for slidably receiving a rod of said reciprocating piston in sealing contact therewith, said flushing means comprising

means forming an annular chamber in said housing, said chamber disposed axially between said inboard and outboard sealing means,

a pressurized fluid source, including a pump and a reservoir, and

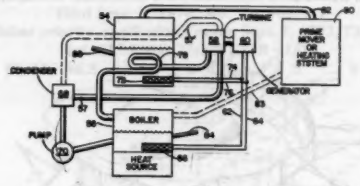
conduit means communicating said pump with said chamber and said chamber with said reservoir for continuously circulating fluid into and out of said chamber for flushing out and for pressurizing said chamber, said inboard annular sealing means comprising annular buffer seal means for substantially restricting outflow of pressurized fluid from one of said working chambers and a separate annular first lip seal disposed adjacent to said buffer seal and facing axially theretowards, said buffer seal means including a flat elastomeric ring member.

3,943,718
STEAM GENERATION SYSTEM

Clyde F. Berry, R.F.D. No. 1, Box 169-C, Manchester, N.H. 03104

Continuation-in-part of Ser. No. 431,204, Jan. 7, 1974, abandoned. This application Mar. 25, 1974, Ser. No. 454,462
Int. Cl.² F01K 13/00
U.S. Cl. 60—676 3 Claims

1. In combination, a first boiler in which steam may be generated, a conventional source of heat for said boiler, a turbine, means for delivering steam from said first boiler to said turbine, a generator driven by said turbine, an electrically operated heating element located within said first boiler energized by current from said generator, said heating element adapted to act when heated as a supplementary source of heat to aid in the production of steam in said first boiler, the steam exhausted from said turbine passing through a pipe to a condenser and a pump for returning the condensate to said boiler, a second steam boiler, means for heating the water in said second boiler to generate steam, said heating means for said second boiler comprising a) an electrically operated heating element located within said second boiler and energized by

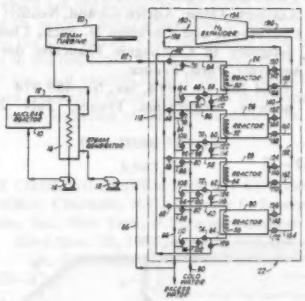


current from said generator, and b) means for delivering steam from said first boiler to said turbine which means comprises a steam carrying pipe that has part thereof positioned in the water of said second boiler, and means for utilizing the steam generated in said second boiler.

3,943,719
HYDRIDE-DEHYDRIDE POWER SYSTEM AND METHODS

Lynn E. Terry, 22 Suncrest Ave., Bridgeton, N.J. 08302, and Roger J. Schoeppel, P.O. Box 971, Stillwater, Okla. 74074

Filed Feb. 26, 1975, Ser. No. 553,248
Int. Cl.² F01K 25/10
U.S. Cl. 60—644 31 Claims



1. A power system comprising:

hydride-dehydride reactor means for chemically forming a hydride by reaction of a hydrideable material with hydrogen gas;

means for periodically supplying hydrogen gas to said reactor means;

means for supplying heat to the reactor means in alternating sequence with the supply of hydrogen gas thereto for effecting chemical compression and dehydriding of the hydride;

means for removing heat from the reactor means; and

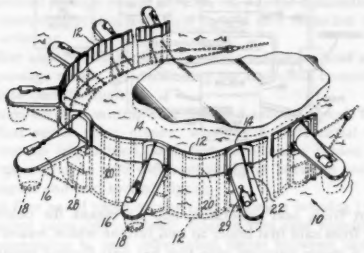
means for continously converting the pressure energy of hydrogen gas released from the reactor means upon dehydriding to shaft power by concurrent expansion and cooling of the hydrogen gas.

3,943,720

FLOATING OIL BARRIER

Jerome H. Milgram, Cambridge, Mass., assignor to Offshore Devices, Inc., Lynn, Mass.

Filed Aug. 30, 1974, Ser. No. 501,870
Int. Cl.² E02B 15/04
U.S. Cl. 61—1 F 8 Claims



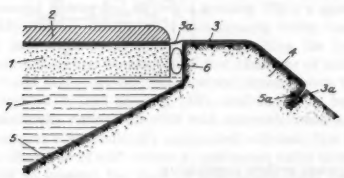
1. A floating barrier, comprising a plurality of elongated flotation units, an elongated flexible vertical barrier extending between corresponding ends of the flotation units, said units being attached to one side only of the barrier so as to extend with the longitudinal axes thereof disposed in a horizontal direction and generally perpendicular to the vertical plane of the barrier, and a counter-weight means attached to the distal end of each flotation unit to counter-balance the weight of the barrier, the side of the barrier opposite the flotation units being free of protrusions.

3,943,721

RESERVOIR FOR STORING HYDROCARBON LIQUIDS AND PROCESS FOR FABRICATING THE SAME

Jean-Paul Azalbert, Ablon; Adrien Giraud, Neuilly; Claude J. Tassin, Courbevoie, and Christian H. Pech, Chatou, all of France, assignors to Campagnie Francaise des Petroles, Societe Anonyme, Paris, France

Filed July 19, 1974, Ser. No. 489,974
Claims priority, application France, July 20, 1973, 73.26767
Int. Cl.² B65G 5/00
U.S. Cl. 61—.5 20 Claims



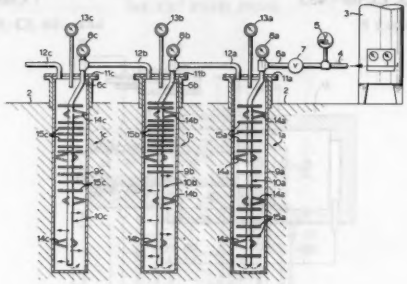
1. A reservoir for storage of liquid, such as a hydrocarbon liquid, comprising a hollow to be filled with liquid whose level is to be maintained substantially constant and a roof for floating on the stored liquid, wherein the roof comprises a non-metallic rigid body which is gastight and of low density, the weight of a meter cube of the body being between 15 kgs and 100 kgs, the body supporting a layer of earth or the like distributed over the whole of its surface and auxiliary gastight means at least along the circumference of the roof, and connected to the circumference of the reservoir for ensuring isolation of the stored liquid.

3,943,722

GROUND FREEZING METHOD

John William Ross, Toronto, Canada, assignor to Union Carbide Canada Limited, Toronto, Canada

Division of Ser. No. 103,089, Dec. 31, 1970, Pat. No. 3,726,095. This application Nov. 6, 1972, Ser. No. 303,754
Int. Cl.² E02D 3/12; B25G 1/08
U.S. Cl. 61—36 A 2 Claims



1. A method of freezing ground by passing nitrogen through a plurality of freeze pipes connected in series and embedded in the ground, each of said freeze pipes consisting of a conductor tube and a header tube coaxially mounted in the conductor tube and extending therein substantially the length of said conductor tube, the steps comprising:

a. continually passing liquid nitrogen under pressure into the header tube of the first of said freeze pipes and discharging the nitrogen from the bottom of said header tube into the lower end of the conductor tube of the first of said freeze pipes and substantially filling said conductor tube with liquid nitrogen.

b. passing the nitrogen overflow from the conductor tube of the first of said freeze pipe into the header tube of the second of said freeze pipes and then discharging liquid and vaporized nitrogen from said header tube into the conductor tube of the second of said freeze pipes through a plurality of apertures in said header tube, said apertures having a total cross-sectional area equal to at least 200 percent of the cross-sectional area of the header tube;

c. and discharging the substantially vaporized nitrogen from the upper end of the conductor tube of the second of said freeze pipes, the passage of nitrogen through the plurality of freeze pipes being at such a rate that the nitrogen discharged from said freeze pipes has a temperature at least as low as −80°C.

3,943,723

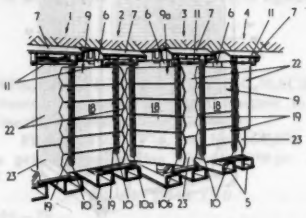
MINE ROOF SUPPORT EQUIPMENT

Frank Evans, Tamworth, and Dennis Alfred Gillard, Burton-on-Trent, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Apr. 9, 1974, Ser. No. 459,376
Claims priority, application United Kingdom, Apr. 27, 1973, 20034/73
Int. Cl.² E21D 19/02
U.S. Cl. 61—45 D 4 Claims

1. In mine roof-support equipment for forming a shield assembly behind a plurality of advanceable roof support means on a longwall face in which each roof support means is advanced separately from the others by lowering the roof support means, advancing it and thereafter raising the roof support means to its support position comprising at least two flexible members one of which is suspended from a mine roof support means while the second flexible member is suspended from an adjacent roof support means and a plurality of cross elements each of which is securable to the two members at spaced points therealong, the improvement whereby said

members at said spaced points have extending therefrom mounting means for pivotally securing each of the cross elements to each flexible member, the mounting means enabling



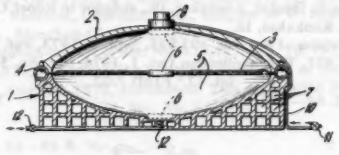
each cross element to pivot independently of each flexible member and said flexible members to maintain themselves in a straight vertical position even when their roof support means is being advanced.

3,943,724

UNDERWATER STATIONARY TANK FOR STORING LARGE AMOUNTS OF CRUDE OIL

Valeriano Banzoli, Mestre; Giovanni De Nora, Spinea; Vincenzo Di Telia, Cappella di Torre Gavetta (Naples); Domenico Lalli, Mogliano Veneto, and Gianfranco Tempo, Venezia Lido, all of Italy, assignors to Tecnomare S.p.A., San Donato Milanese, Italy

Filed Apr. 11, 1974, Ser. No. 460,220
Claims priority, application Italy, Apr. 13, 1973, 22953/73
Int. Cl.² B65D *86/16*
U.S. Cl. 61—46.5 **3 Claims**



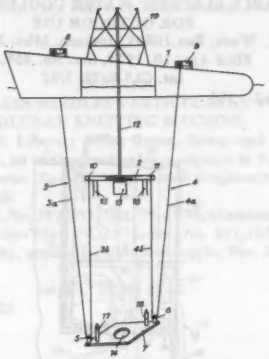
1. A submersible tank for the storing of oil under water adapted to be stably positioned on a submerged bed so that it is located beneath the water surface, comprised of a planoconcave lens-shaped foundation plate having a flat lower face and a concave upper face, a cupola adapted to be mounted on said foundation plate to form a spheroidal chamber, an expansible separating wall attached to the foundation plate along its upper edge so that it extends across said spheroidal chamber and divides it into a lower sub-chamber and an upper sub-chamber, a valve adapted to control the flow of water into and out of the lower sub-chamber, a second valve adapted to control the flow of oil into and out of the upper sub-chamber, and extensible and retractable tie means mounted on the foundation plate and adapted to pull the cupola downwards against the foundation plate.

3,943,725

APPARATUS FOR GUIDING A LOAD BETWEEN A SURFACE APPARATUS AND A SUBMERGED BASE PLATFORM

Michael Derek Pennock, Pinner, England, assignor to Subsea Equipment Associates, Ltd., Hamilton, Bermuda

Filed Sept. 3, 1974, Ser. No. 502,311
Claims priority, application France, Sept. 3, 1973, 73.31692
Int. Cl.² E02D *27/52*; E21B *43/01*
U.S. Cl. 61—46.5 **9 Claims**



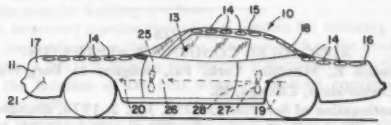
1. Apparatus for guiding a load between a surface apparatus and a submerged base platform comprising at least two return pulleys mounted on to the base platform, at least two cables passing over the pulleys, one of the runs of each cable being connected to the surface apparatus by means of a drum driven by a winch, wherein each cable passes around a drum, the shafts of which are interconnected by clutch means, the other run acting to guide a load-carrier, and means for horizontal levelling of the load-carrier, each run passing from the respective pulley to the respective winch separating from the respective guide run as it extends away from the respective pulley and the runs connected to the load-carrier being orientated by the latter in the direction of the surface apparatus.

3,943,726

SOLAR COOLING SYSTEM FOR AN AUTOMOBILE

John H. Miller, Charlotte, N.C., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Mar. 20, 1975, Ser. No. 560,154
Int. Cl.² H01L *31/04*; F25B *27/00*
U.S. Cl. 62—2 **3 Claims**



1. A solar cooling system for a standard automobile, which comprises:

a. said standard automobile having a trunk lid, a front hood, a roof, and a rear window;

b. a plurality of solar energy cells positioned on said roof, said trunk lid, and said front hood, and a periphery of said rear window;

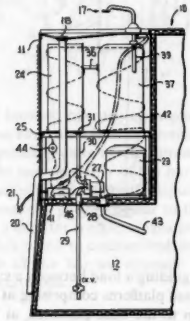
c. said plurality of solar energy cells wired in a series circuit to a voltage regulator, a storage battery, a thermostatic temperature control unit, and a cooling unit:

d. said cooling unit contained in an interior chamber of said automobile;
e. a plurality of cool air ducts communicating between said interior chamber and an outside surface of said automobile; and
f. a plurality of hot air ducts communicating between said interior chamber and said outside surface of said automobile.

3,943,727
PORTABLE ELECTRIC WATER COOLER SUITABLE FOR OUTDOOR USE

George C. Wade, Box 10801, Jackson, Miss. 39209

Filed Apr. 10, 1974, Ser. No. 459,778
Int. Cl.² B67D 5/62
U.S. Cl. 62—395 **4 Claims**



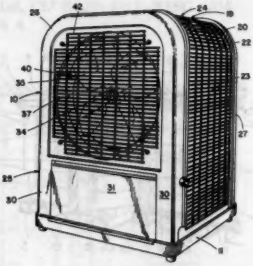
3. A refrigerated water cooler characterized in that it is adapted for outdoor use in sub-freezing temperatures, said water cooler comprising:
a reservoir for storing water to be refrigerated;
refrigeration means for cooling water passed therethrough from said reservoir;
an outlet spigot connected to receive cooled water passed through said refrigeration means and conduct said cool water externally of said water cooler;
actuable means for selectively delivering water from said reservoir through said refrigeration means to said outlet spigot; and
thermostatically-controlled electrical heating means disposed in said water cooler for automatically maintaining the temperature in said water cooler above the freezing temperature of water;
wherein said heating means comprises an electrical heating cable wrapped about the outer surface of and in direct contact with said reservoir and said refrigeration means.

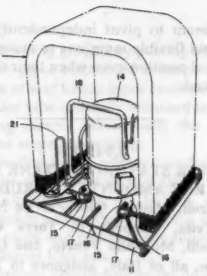
3,943,728
AIR-COOLED CONDENSER APPARATUS

Wendell E. Maudlin, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 430,295, Jan. 2, 1974, abandoned. This application Mar. 7, 1975, Ser. No. 556,246
Int. Cl.² F25B 39/04
U.S. Cl. 62—507 **1 Claim**

1. A condenser - compressor unit comprising: a base member; a refrigerant compressor mounted in the central portion of said base member; an inverted, generally U-shaped heat exchange coil having a pair of generally vertically disposed leg portions and an upper connecting portion, the bottom of said leg portions being secured to said base member on opposite sides thereof with the upper connecting portion extending over said refrigerant compressor and forming a pair of open sides; a pair of oppositely disposed end panels closing the open sides of said coil member and being provided with a central opening formed with a venturi entrance; a pair of fans adjacent said openings mounted on a common drive shaft; and a motor for driving said fans to induce air flow through said



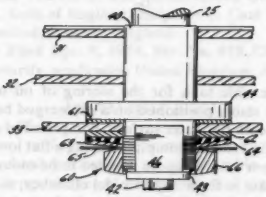


venturi entrances into the space defined between said end panels, said leg portions, and said upper connecting portion, whereby air is caused to flow through substantially the entire surface of said heat exchange coil.

3,943,729
FRICTION CLUTCH FOR POWER DRIVEN ELEMENT SUCH AS A ROTARY BLADE

Douglas D. Dankel, Kankakee, Ill., assignor to Roper Corporation, Kankakee, Ill.

Division of Ser. No. 393,825, Sept. 4, 1973, Pat. No. 3,857,521. This application Oct. 1, 1974, Ser. No. 511,018
Int. Cl.² F16D 7/02
U.S. Cl. 64—30 C **7 Claims**



1. In an engine driven appliance, the combination of a shaft having a radial flange and an adjacent thread, a power driven element telescoped over the shaft, a nut engaging the thread, and a washer assembly telescoped over the shaft adjacent the power driven element, the washer assembly including a rubber washer, an adjacent Bellville washer and an auxiliary washer, the rubber washer being sandwiched between the Bellville

washer and the auxiliary washer and the Bellville washer having its concave side faced toward the rubber washer so as to confine the rubber washer against the auxiliary washer while inhibiting radial expansion of the rubber washer as the nut is tightened, thereby to provide clutching force, the reaction of the confined rubber washer providing a sharply increasing spring rate as the nut is tightened thereby to prevent collapse of the Bellville washer upon severe tightening of the nut.

3,943,730

CONTROL DEVICE FOR KNITTING MACHINES

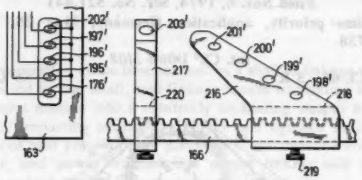
Erich Krause, Bopfingen, Germany, assignor to Universal Maschinenfabrik, Westhausen, Germany

Filed Apr. 25, 1974, Ser. No. 464,098

Claims priority, application Germany, Apr. 25, 1973, 2320845

Int. Cl.² D04B 7/10

U.S. Cl. 66—70 **5 Claims**



1. A limit switch arrangement for controlling the patterning and working width of a flat-bed knitting machine having a movable carriage comprising a plurality of magnetically responsive limit switches mounted on said carriage in a row at right angles to the direction on travel of said carriage, holder means adjustably mounted on said bed for movement in the direction of travel of said carriage and a plurality of permanent magnets mounted on said holder means with each magnet being offset from the other in the direction of movement of said carriage and in alignment with respective one of said switches.

3,943,731

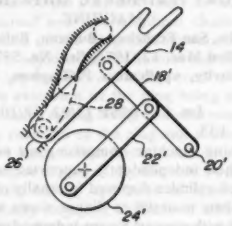
METHOD AND MEANS FOR FORMING KNIT FABRIC INCORPORATING A FANCY WARP STITCH WEAVE

Kurt W. Niederer, Charlotte, N.C., assignor to W. Schlafhorst & Co., Monchen-Gladbach, Germany

Continuation-in-part of Ser. No. 423,485, Dec. 10, 1973, Pat. No. 3,874,201, which is a continuation-in-part of Ser. No. 64,435, Aug. 17, 1970, abandoned. This application Dec. 30, 1974, Ser. No. 537,344

Int. Cl.² D04B 23/00, 27/00

U.S. Cl. 66—86 B **3 Claims**



1. In the formation of warp knit fabric made to simulate a woven structure which involves the steps of inlaying spaced warp ends at the back side of a needle array while laying filling ends at opposite sides of the warp inlay, the improvement which comprises operating said needle array and feeding knitting ends thereto to form warp stitch chains at the spaces between said warp ends, while causing all filling ends at the side of said warp inlay adjacent the needles of said array to remain at the back of said needles and forcing all filling ends at the other warp inlay side to the front of said needles in timed relation, so that the filling ends forced to the front of said needles are knit-in by said warp stitch chains and the filling ends remaining at the back of said needles are interlaced by said warp ends and warp stitch chains.

3,943,732

SHOCKLESS NEEDLES PARTICULARLY FOR CIRCULAR KNITTING MACHINE

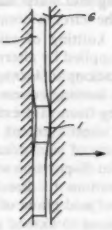
Jaroslav Kopal, Liberec; Milos Jansa, Brno, and Jaroslav Deiss, Tisnov, all of Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi, Brno, Czechoslovakia

Division of Ser. No. 102,333, Dec. 29, 1970, abandoned. This application Mar. 14, 1974, Ser. No. 451,185

Claims priority, application Czechoslovakia, Dec. 29, 1969, 8557-69

Int. Cl.² D04B 35/02

U.S. Cl. 66—123 **1 Claim**



1. In a circular knitting machine having knitting needles with elongated shanks slidably mounted in tricks in a rotatable needle carrier, each of said needles having an outwardly protruding integral butt for engagement with needle sliding cams on the circular knitting machine,

an improved construction of said needles for reducing the impact forces in the needles, wherein each of the needles has a laterally bulging pre-sprung portion in the shank at the location of the butt which is at least coextensive therewith,

the lateral bulging of said pre-sprung portion in the shank including the entire cross-section of the needle shank including the butt and being in the direction of rotation of the needle carrier,

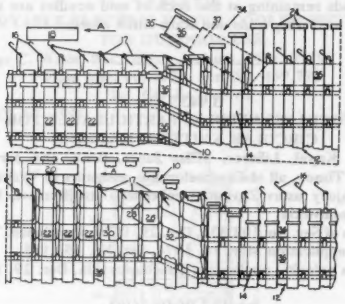
the width of said tricks exceeding the stock width of said shanks,

whereby the bulging portion of the needle shank is in sliding contact with the confronting first lateral side wall of the respective trick portions of said shank spaced in opposite directions axially of said shank from said laterally bulging pre-sprung portion being in sliding contact with the side wall of the respective trick opposite said first lateral side wall.

3,943,733
METHOD AND APPARATUS FOR PRODUCING A KNITTED FABRIC INTERLACED WITH INSERT ELEMENTS

John L. Wily, Reading, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Apr. 24, 1974, Ser. No. 463,538
Int. Cl.² D04B 3/06
U.S. Cl. 66—125 R 8 Claims



1. An improved circular weft knitting machine of the type which feeds warp insert elements between selected adjacent wales of a basic knitted fabric; wherein said improvement comprises:

means for directing said warp insert elements inwardly and outwardly of the circumferential plane of the knitting needles during knitting of said knitted fabric which is consequently supplied by alternating interior and exterior knitting feed stations to locate each said warp insert on the outside of a knitting course of connecting elements of loops originating from said exterior feed stations;

at least one weft insert element feed station mounted outside of said plane of said needles in a circumferentially and radially fixed disposition with respect to said exterior knitting feed stations to directly feed a weft insert element inwardly of said plane of said needles to cause said weft insert element to extend along the inside surface of said knitted fabric between said warp insert elements and said knitted fabric, whereby,

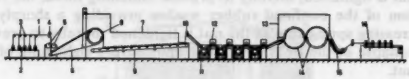
said directing of said warp insert elements outside of said plane of said needles and forming the next said knitting course originating from said interior knitting feed stations secures said weft insert element between said warp insert elements and said knitted fabric.

3,943,734
APPARATUS FOR THE CONTINUOUS TREATMENT OF TEXTILE MATERIAL

Heinz Fleissner, Egelsbach near Frankfurt am Main, Germany, assignor to Vepa AG, Basel, Switzerland

Division of Ser. No. 352,348, April 18, 1973, Pat. No. 3,835,490, which is a continuation of Ser. No. 13,988, Feb. 25, 1970, abandoned, which is a continuation-in-part of Ser. No. 831,952, June 10, 1969, abandoned. This application Apr. 29, 1974, Ser. No. 465,346
Claims priority, application Germany, Feb. 26, 1969, 1909646; Jan. 31, 1970, 2004390
Int. Cl.² D06B 3/02, 21/00
U.S. Cl. 68—5 D 12 Claims

10. An apparatus for the treatment of textile material which comprises, in combination, impregnating means, inlet means for introducing a plurality of slivers in the form of a web to the impregnating means, a drying and fixing chamber having a heating section at an inlet end and a dwell section at an outlet end, said chamber containing a plurality of sieve drum means arranged in series and subjected to a suction draft within said heating section and a perforated conveyor belt means disposed below the first one of said plurality of sieve drum means

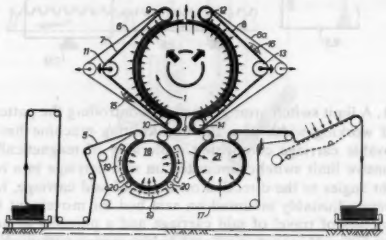


and extending from the inlet end to the outlet end of said chamber and means for conveying the material being treated from the impregnating means to the first sieve drum means in the drying and fixing chamber.

3,943,735
CONTINUOUS DECATIZING MACHINE

Dieter Riedel, Hausberge, Porta, Germany, assignor to Drabert Sohne, Westphalia, Germany

Filed Nov. 6, 1974, Ser. No. 521,441
Claims priority, application Germany, May 28, 1974, 2425738
Int. Cl.² D06B 5/08
U.S. Cl. 68—5 R 9 Claims



1. In a continuous decatizing machine,

a rotatable, heatable, decatizing cylinder, the cylinder having a circumferential wall provided with holes distributed over the wall,

means for feeding steam to the decatizing cylinder such that said holes are fed with steam,

means for feeding material to be decatized around the cylinder,

backing cloths applied against the material around a portion of the cylinder, and

two heatable pressure strips, said strips being impermeable to steam, each said strip being applied against a respective backing cloth over an arc of less than 180°.

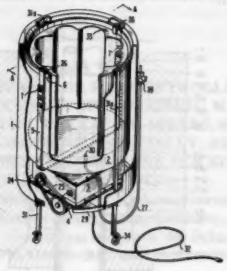
3,943,736
OSCILLATORY PERIPHERAL AGITATION WASHING MACHINE

Jesus R. Carin, San Francisco, Bulacan, Bulacan, Philippines

Filed Mar. 12, 1975, Ser. No. 557,693
Claims priority, application Philippines, Mar. 13, 1974, 15615
Int. Cl.² D06F 13/02, 17/10
U.S. Cl. 68—133 6 Claims

1. A washing machine comprising an outer open-ended cylindrical shell independently supported on legs; an inner bottom-closed cylinder disposed internally of said outer shell defining a fabric material or dinner wares washing chamber and provided with support means independent of said support legs of the outer shell; agitator means freely rotatable and disposed peripherally and internally of said inner cylinder, said agitator having an inner wall with equally spaced longitudinal projections throughout said inner wall to effect the

creation of water jets directed toward the center of said inner cylinder when said agitator is actuated thereby effecting the washing of materials deposited within said inner cylinder, said agitator further having an upper edge; yoke support means having an upper portion and a base, said yoke support means supporting said upper edge of said agitator at said upper portion of said yoke support means, said yoke support means



being supported at the base thereof by a shaft, a linkage means connected to said shaft, said linkage means translating a rotative input motion into a rotatively oscillating output motion thereby imparting similar motion to said agitator means by means of said yoke support means; a prime mover having an output; and power transmission means linking said prime mover output to said linkage means.

3,943,737

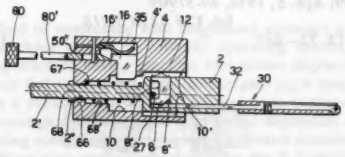
MECHANISM USABLE WITH LOCKS AND TWO APPLICATIONS WHEREIN SAID MECHANISM IS USED

Luigi Lerro, Viale XXI Aorile 38B, Rome, Italy

Filed Mar. 28, 1975, Ser. No. 563,217

Int. Cl.² E05B *63/14, 29/08;* B60R *25/02*

U.S. Cl. 70—106 **6 Claims**



1. A locking mechanism which comprises two prismatic members with parallel longitudinal axes and front and rear bases perpendicular thereto, one of which members, named plug, being slidably received into a longitudinal cavity of the other member named body, which plug has a transverse recess extending from one of the plug side faces to nearly reach an opposite face thereof and a longitudinal channel extending from the front face of the plug to communicate with said recess at a position adjacent to the bottom thereof, said cavity having a hole at one end thereof with a cross section smaller then the plug, an extension of the plug being slidably fitted through said hole and a spring being wound around said extension between the rear end of the plug and a shoulder of said body around said hole; a receptacle extending transversely from the inner surface of said cavity into said body, said recess and said receptacle having apertures of identical size and shape on reciprocally engaging surfaces of said plug and of said body, two sets of plates in identical number in side-by-side relation parallel to the plug longitudinal axis being received one set into said recess and the other into said receptacle, the plates of the two sets being individually slidable in a direction transverse to said plug and having all the same cross section in a plane perpendicular to said direction, the plates in said recess having different dimensions in said direction, each of them having the corner adjacent to said channel bevelled along a plane perpendicular to the plate plane, the plates in said receptacle having all the same dimensions and being each provided with a lug adapted for engaging a shoulder of said body within said receptacle and being each urged by a spring to move towards said plug; a key made up of as many bars as are the plates of one of said sets which bars have all the same height and thickness, this being the same as said plates, but different lengths, one end of each bar being bevelled along the same plane as said corners of the plates in said recess; said bars being removably assembled together in side-by-side relation to form a bundle adapted to fit into said channel of said plug; the lengths of said bars being such that when the key is fully inserted into said channel the upper edges of the plates in said recess are brought to the level of the interface between said body and said plug.

3,943,738

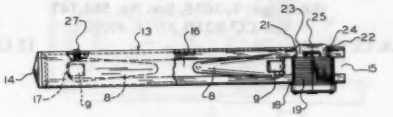
OUTBOARD MOTOR LOCK

Daniel J. Foote, Milwaukee, Wis., assignor to Master Lock Company, Milwaukee, Wis.

Filed Nov. 1, 1974, Ser. No. 519,865

Int. Cl.² F16B *41/00*

U.S. Cl. 70—232 **2 Claims**



1. In combination, a support; clamps for an outboard motor-carrying bracket; transversely spaced apart headed and shanked members for securing the clamps to said support; a slotted hollow housing of greater length than the transverse line of clamp securing members for longitudinal sliding application to said securing members with the shanks of latter being received by said housing slot and the securing member heads being confined within the housing, one end of the housing being open, there being a second opening in a wall portion of the housing adjacent to its open end and removed from the housing slot and of a size and shape to permit the snug passage therethrough of the body of a padlock; a shackle-equipped padlock formed with a body with the latter being removably introduced into said housing through said second opening transversely of the longitudinal axis of the housing, the padlock shackle being completely removable from the body, a wall of the housing opposite that which contains said second opening being formed with a third opening in registration with said second opening to permit the passage of the legs of the padlock shackle therethrough; and means for locking said padlock body against unauthorized removal from the housing, the padlock body forming a stop to prevent sliding movements of the housing relative to said securing members.

3,943,739

PIN TUMBLER LOCK

Joseph M. Genakis, 948 W. Boylston St., Worcester, Mass. 01606

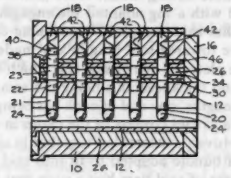
Filed Apr. 3, 1974, Ser. No. 457,586

Int. Cl.² E05B *63/00*

U.S. Cl. 70—419 **4 Claims**

1. A pin tumbler lock comprising an enclosure, a plug therein, a keyway in the plug, a set of pinways, a set of bottom and top pins in the pinways, and an insert riding on the exterior surface of the plug, the insert having an aperture therein to receive the top portion of the bottom pin,

a sleeve surrounding the plug, a longitudinal recess in the sleeve at the interior surface thereof, said insert being movably located in said recess,



top pins in the enclosure cooperating with the bottom pins, a longitudinal recess in the interior surface of the enclosure parallel with respect to the recess in the sleeve and at least one apertured insert movably mounted in said recess, for the reception of a top pin therein in general alignment with a corresponding bottom pin.

3,943,740

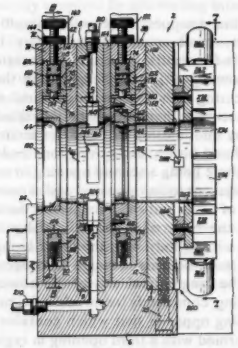
TOOL PACK FOR FORMING METALLIC CONTAINERS

Michael F. Bartenstein, Proctor, Vt., assignor to Vermont Marble Company, Proctor, Vt.

Filed Apr. 1, 1075, Ser. No. 564,147

Int. Cl.² B21D *37/14, 45/00*

U.S. Cl. 72—45 **12 Claims**



1. A tool pack for mounting forming dies in a metal drawing machine, said machine including at least one ram, and said tool pack comprising: a mounting frame mountable on said drawing machine in general alignment with said ram, said mounting frame including at least one mounting slot open at the top and along at least a portion of its outer side, and having a bottom wall and an inner side wall arranged at right angles to each other in order to form a seat; a cartridge having means therein for mounting a forming die, said cartridge being rectangular in shape and including a bottom wall, a top wall and side walls arranged at right angles to each other, said cartridge being receivable within said mounting slot with one corner thereof engaged on said seat; and hydraulic clamping means arranged to engage the corner of said rectangular cartridge opposite the corner engaged with said seat, operable to firmly secure said cartridge within said mounting slot.

3,943,741

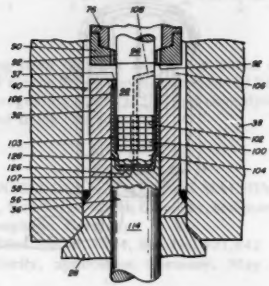
EMBOSSING METHOD

Willis W. Sunderland, Worthington, Ohio, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 25, 1975, Ser. No. 561,754

Int. Cl.² B21D *26/04*

U.S. Cl. 72—57 **8 Claims**



1. A method of forming a hollow metal part having a desired internal embossment, comprises the steps of:

extruding a hollow blank through a die onto a non-collapsible cylindrical mandrel having an external surface pattern counter to the desired embossment in said part, to emboss a portion of the blank; and

hydrostatically expanding the embossed portion of said blank outward away from said mandrel, to release the blank from the mandrel for removal therefrom.

3,943,742

ROLLING MILL

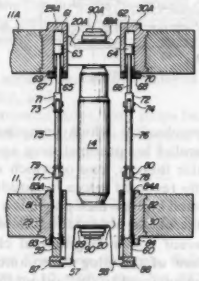
Toshiyuki Kajiwara, and Noriyoshi Sonobe, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 12, 1974, Ser. No. 496,828

Claims priority, application Japan, Aug. 24, 1973, 48-94399; Apr. 5, 1974, 49-37909

Int. Cl.² B21B *31/18*

U.S. Cl. 72—247 **15 Claims**



1. A rolling mill comprising a housing, a pair of work rolls each mounted at opposite ends thereof in roll chocks, at least one pair of rolls largers in diameter than said pair of work rolls and adapted to back up said work rolls, each of said at least one pair of larger diameter rolls also being mounted at opposite ends thereof in roll chocks, said roll chocks for at least one of said pair of work rolls and said pair of large diameter rolls being supported by blocks forming parts of juxtaposed members of the housing and detachably attached thereto, the roll chocks supporting at least one of said pair of work rolls and said pair of larger diameter rolls being slidable on surfaces of

said blocks and in a direction in which pressure is applied to the rolls to effect rolling and in a direction transverse thereto, hydraulic cylinders mounted within or on surface of said blocks and each receiving a piston therein, and output shafts connected to said pistons and arranged parallel to the axes of the rolls, said output shafts each being connected to an arm affixed to either one of the roll chocks supporting said rolls whereby said rolls can be moved axially thereof by said output shafts.

3,943,743

METHOD AND APPARATUS FOR CONTROLLING WITH INCREASED ACCURACY A PROCESSING MACHINE DRIVEN AT VARYING OPERATING SPEEDS, SUCH AS A SLIDE DRAWING MACHINE, ESPECIALLY, AS WELL AS THE SLIDE DRAWING MACHINE PER SE AND AUXILIARY DEVICE

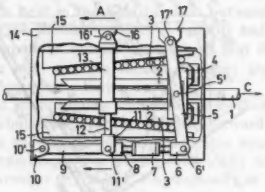
Walter Wetzels, Eynatten, Belgium; Johann Greven; Wilhelm Romer, both of Aachen-Schleckheim, Germany, and Heinz Hoppe, Aachen, Germany, assignors to Schumag Schumacher Metallwerke Gesellschaft mit beschrankter Haftung, Aachen, Germany

Filed Apr. 30, 1974, Ser. No. 465,620

Claims priority, application Germany, May 3, 1973, 2322279; Nov. 9, 1973, 2356046; Jan. 28, 1974, 2403872

Int. Cl.² B21C *1/14*

U.S. Cl. 72—290 **14 Claims**



1. Method of controlling with heightened accuracy a processing machine driven at different operating speeds, the processing machine having machine tool means displaceable over a given full range and a machine part moving in synchronism with a cycle of the process that has been instituted in advance through a precontrolled time period dependent upon the operating speed and which includes a control commencement build-up time and a time period for the full-range displacement of the machine tool means, and, at an initial setting of the moving machine part, within a given tolerance range permitting start-up of said processing cycle, which comprises interposing a blocking time period between the control commencement build-up time period and the full-range displacement time period, the blocking time period always ending at an instant at which the moving machine part is at the same position in the displacement range thereof, blocking the full-range displacement of the machine tool means until the end of the blocking time period, and advancing the start of the control commencement build-up time period in accordance with the blocking time period.

3,943,744

LOUVER CUTTER

Walter G. Marsh, Birmingham, and James J. Rhoades, Westland, both of Mich., assignors to Tapco Products Company, Inc., Detroit, Mich.

Filed June 19, 1974, Ser. No. 480,813

Int. Cl.² B21D *31/02*

U.S. Cl. 72—326 **4 Claims**

1. A louver cutter comprising

a body having a pair of spaced arms,

the lower arm defining a base and the upper arm overlying the base,

a lower die pad,

means for rotatably mounting said lower die pad on said base for rotation about a vertical axis,

means for locking said lower die pad in any adjusted position,

a lower die block,

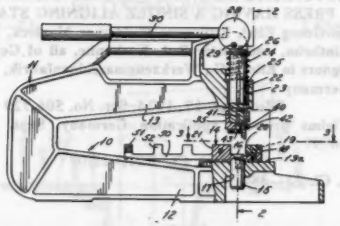
means for fastening said lower die block on said lower die pad such that the lower die pad has a portion projecting upwardly and spaced from the lower die block,

a cylindrical piston slidable for vertical movement in said upper arm and selectively indexable in said upper arm,

means for moving said piston toward and away from said lower die block,

an upper die block,

said upper die block comprising an opening therein into which said piston extends,



said opening having a substantially closed bottom,

the end of said piston abutting the bottom of said opening,

and fastener means for releasably holding said upper die block on said piston,

a cutter blade,

said cutter blade having a contacting surface,

said upper die block having a complementary surface engaging said surface of said blade,

said upper die block having a portion thereof cut away to define an opening to expose a portion of said piston,

said piston having a surface complementary and aligned with the related surface of said die block is engaged by said surface of said blade through said opening in said upper die block,

and fastener means for releasably holding said blade on said upper die block and, in turn, holding said die block against rotation with respect to said piston.

3,943,745

PIERCING AND COINING APPARATUS

William A. Paul, 1808 Parkside Blvd., Toledo, Ohio 43607

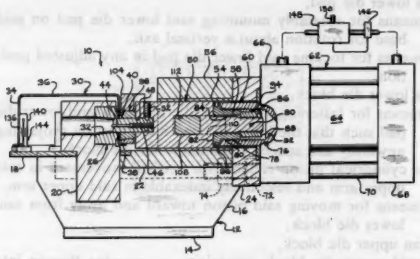
Filed Mar. 27, 1975, Ser. No. 562,790

Int. Cl.² B21D *28/00*

U.S. Cl. 72—335 **10 Claims**

1. Apparatus for piercing and coining a workpiece comprising a main frame, means on said frame for locating the workpiece, a back-up die, means for supporting said die on said frame on one side of the workpiece, a ram on the other side of the workpiece, a punch carried by said ram and extending toward the workpiece, a coining die in front of said ram and positioned around a portion of said punch, a shedder pin carried centrally in said punch and extending forwardly

thereof, means for resiliently connecting said ram and said coining die, said coining die being spaced from said ram prior



to said coining die contacting the workpiece and means for moving said ram toward and away from the workpiece.

3,943,746

AUTOMATIC ALIGNING PROCESS AND ALIGNING PRESS HAVING A SINGLE ALIGNING STATION

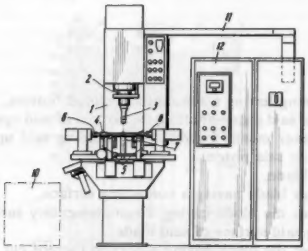
Hans-Georg Eitel, Ettlingen; Waldemar Morlock, Karlsruhe-Rintheim, and Dieter Ruf, Karlsruhe, all of Germany, assignors to Eitel KG., Werkzeugmaschinenfabrik, Karlsruhe, Germany

Filed Sept. 17, 1974, Ser. No. 506,729

Claims priority, application Germany, Sept. 17, 1973, 2346797

Int. Cl.[2] B21D *17/02*

U.S. Cl. 72—384 12 Claims



1. A process for automatically straightening elongated and at least partly rotationally symmetrical workpieces, including the application of a sequence of straightening strokes to a workpiece at one straightening station to counteract a deformation comprising the steps of:

a. rotating the workpiece through a full revolution;

b. detecting the maximum value and minimum value of deformation of said rotating workpiece;

c. determining the mean value of the maximum and minimum deformation detected;

d. again rotating the workpiece;

e. sensing the instantaneous values of deformation during rotation of the workpiece;

f. comparing the instantaneous values of deformation of the rotating workpiece with the mean value to detect a change of sign in the difference between said mean value and said sensed instantaneous values of deformation;

g. positioning the deformation of said workpiece towards an element applying the straightening stroke when said change of sign is detected;

h. comparing the instantaneous value of the positioned deformation to said mean value to determine whether a preset deformation tolerance is exceeded;

i. applying a straightening stroke if said sign is positive and said deformation tolerance is exceeded, the first straightening stroke of the sequence having a depth of stroke such that the straightening element is brought close to or touching the workpiece and a subsequent straightening stroke of the sequence having a depth of stroke increased from that of the previous straightening stroke by the latest measured difference between the instantaneous value of the positioned deformation and the mean value; and

j. repeating steps (h) and (i) until the deformation tolerance is not exceeded.

3,943,747

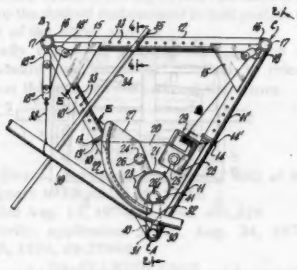
PORTABLE HOT PIPE BENDING APPARATUS

Allan B. Wesler, New York, and Lyber Katz, Bronx, both of N.Y., assignors to Tubeco, Inc., Brooklyn, N.Y.

Filed Dec. 27, 1973, Ser. No. 428,750

Int. Cl.[2] B21D *11/02*

U.S. Cl. 72—388 10 Claims



1. Transportable apparatus for the hot-bending of relatively large tubular pipe, comprising an assembled generally triangular rigid frame of three tubular-pipe legs, said frame consisting of at least two subassemblies having detachable interconnection means; one of said subassemblies comprising a rigid triangle of adjacent tubular-pipe parts of two of said legs, with upper and lower triangular plates secured along corresponding edges to and spaced by said adjacent tubular-pipe parts, die-supporting stanchion means upstanding from the upper plate and secured to both plates, an arcuate forming die removably mounted to said stanchion means adjacent the upper plate, the orientation of said die being such that the bending arc of said die is convex outward and overstands one to the exclusion of the other of said adjacent leg parts, a winch and means for removably mounting the same on said upper plate at a location offset from said die in the direction of the other of said leg parts, and a back-up shoe and means for removably mounting the same at the apex of said one subassembly; the other of said subassemblies including the third tubular-pipe leg joined at its ends to the remaining tubular pipe parts of said two legs, and said detachable interconnection means connecting adjacent corresponding ends of said tubular-pipe leg parts; and block-and-tackle means including pulleys removably connected at substantially the ends of said third leg and including a line connection to said winch.

3,943,748

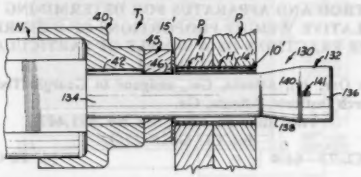
COLDWORK SYSTEM WITH DELAY SPLIT SLEEVE

John O. King, Jr., 3990 N. Ivy Road, Atlanta, Ga. 30342

Continuation-in-part of Ser. No. 324,485, Jan. 17, 1973, Pat. No. 3,835,688, which is a continuation-in-part of Ser. No. 268,478, July 3, 1972, Pat. No. 3,835,615, which is a continuation-in-part of Ser. No. 33,281, April 30, 1970, abandoned, which is a continuation-in-part of Ser. No. 711,368, March 7, 1968, abandoned. This application July 17, 1974, Ser. No. 489,253

Int. Cl.² B21D 41/02

U.S. Cl. 72—393 4 Claims



1. A method of coldworking a hole through a work piece comprising the steps of:

a. holding the tubular member within the hole through the work piece;

b. passing a mandrel having an expansion section thereon larger than the initial inside diameter of the tubular member axially through the tubular member while the tubular member is held in the hole to exert outwardly directed forces on the tubular member to radially and circumferentially expand a tubular member so that the material about the hole and the tubular member are expanded beyond their elastic limits; and,

c. forming a longitudinally extending groove on the inside of the tubular member while the outwardly directed forces are exerted thereon to reduce the strength of the tubular member at the groove sufficiently to cause the tubular member to fracture longitudinally as an incident to the expansion of the tubular member.

3,943,749

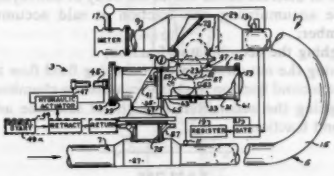
UNIDIRECTIONAL METER PROVER SPHERE INTERCHANGE AND METHOD

Davis A. Van Scoy, Simonton, Tex., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Sept. 16, 1974, Ser. No. 506,468

Int. Cl.² G01F 25/00

U.S. Cl. 73—3 17 Claims



1. In a undirectional meter proving device comprising a piping loop having an upstream end and a downstream end; a pair of detectors in the loop for defining a calibrated section of the loop; and a sphere interchange comprising a housing having a first opening communicating with the outlet end of the piping loop and a second opening communicating with the inlet end of the piping loop, and seal means in the housing for providing a fluid seal between the first opening and the second opening during a proving run, the improvement wherein the seal means comprise:

a. a closure member reciprocable along an axis of movement, the closure member comprising

1. an annular flange lying substantially in a plane perpendicular to the axis of movement of the closure member, and

2. a resilient annular seal carried on the flange;

b. a valve seat in the housing between the first opening and the second opening, the valve seat comprising

1. an annular seating face lying substantially in a plane perpendicular to the axis of movement of the closure member, and

2. an annular groove in the seating face, said annular groove being proportioned and positioned to be sealed by the resilient seal, pressure in the groove being increased by compression of the resilient seal into the groove; and

c. seal testing means responsive to increased pressure in the groove.

3,943,750

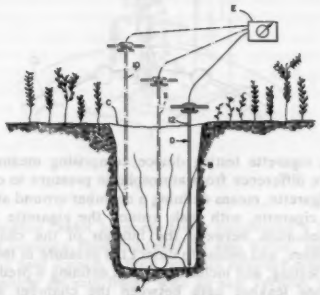
PROBE COLLECTOR FOR SUBTERRANEAN GASES

Jack E. McLaughlin, Yuba City, Calif., assignor to Andermac, Inc., Yuba City, Calif.

Filed Dec. 13, 1974, Ser. No. 532,669

Int. Cl.² G01V 9/00

U.S. Cl. 73—23 2 Claims



1. A method for detecting the presence of a putrefying subterranean body which comprises: introducing into a site of a burial area suspected of containing a petrefying body a probe downwardly into the ground; providing an internal gas receiving opening near the bottom of said probe plugged by a protecting member; withdrawing said member to expose said opening to a chamber caused by removing said member to draw vapors into said probe withdrawing vapors through said opening to a gas analyzer; and, analyzing said vapor for at least one gas selected from the group consisting of methane, hydrogen sulfide, hydrogen phosphide, carbon dioxide and hydrogen.

3,943,751

METHOD AND APPARATUS FOR CONTINUOUSLY MEASURING HYDROGEN CONCENTRATION IN ARGON GAS

Takao Akiyama; Satoru Takani, and Hideo Atsumo, all of Mito, Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Apr. 22, 1975, Ser. No. 570,374

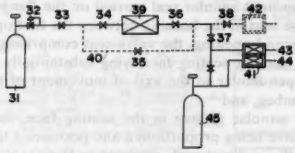
Claims priority, application Japan, May 8, 1974, 49-50931

Int. Cl.² G01N 31/00

U.S. Cl. 73—27 R 11 Claims

1. A method for continuously measuring the concentration of hydrogen in argon gas containing hydrogen and other impurities comprising the steps of continuously passing the argon gas containing hydrogen and other impurities through a high

temperature metal getter to thereby remove impurities other than hydrogen from the argon gas and produce a two-component gas mixture consisting of argon and hydrogen, continu-



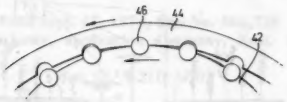
ously detecting the thermal conductivity of the two-component gas mixture, and determining the hydrogen concentration from the thus detected thermal conductivity.

3,943,752

TESTING OF CIGARETTES

Eryk Stefan Doerman, and Ivan Yehudi Hirsh, both of London, England, assignors to Molins Limited, Great Britain

Filed May 3, 1974, Ser. No. 466,839
Int. Cl.² G01M *3/26*
U.S. Cl. 73—41 **7 Claims**



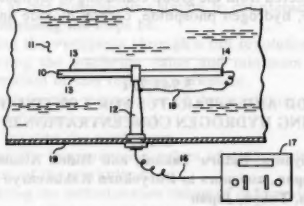
1. A cigarette testing device comprising means to apply pressure difference from atmospheric pressure to one end of each cigarette; means defining a chamber around at least part of the cigarette, with seals around the cigarette to restrict communication between the interior of the chamber and atmosphere; and means to detect the pressure in the chamber during testing; and including means defining a predetermined deliberate leakage path between the chamber and atmosphere.

3,943,753

SOLID STATE VISCOSIMETER

Frank N. Simon, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 17, 1974, Ser. No. 479,727
Int. Cl.² G01N *11/16*
U.S. Cl. 73—54 **11 Claims**



1. A viscosimeter for providing representation of viscosity of a fluid, said viscosimeter comprising:

a piezoelectric voltage transformer, having electrical terminals thereon serving as input terminals and output terminals, said transformer having surfaces thereof placed in motion in directions in which they are capable of imparting shear waves to those portions of said fluid sufficiently near said surfaces;

oscillator circuitry means for providing an oscillating electrical voltage at said input terminals; and

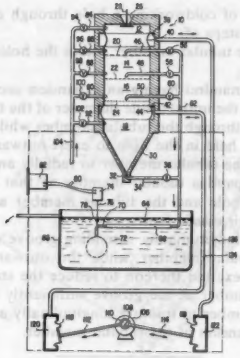
output voltage sensing means which senses an oscillating output voltage signal provided between said output terminals to provide said representation, with oscillations in said output voltage signal occurring at frequencies where said output voltage signal has substantially a maximum amplitude.

3,943,754

METHOD AND APPARATUS FOR DETERMINING THE RELATIVE WEIGHT PROPORTIONS OF DIFFERENT SIZE FRACTIONS OF A SAMPLE OF PARTICULATE MATERIAL

Clyde Orr, Jr., Atlanta, Ga., assignor to Georgia Tech Research Institute, Atlanta, Ga.

Filed June 30, 1975, Ser. No. 591,407
Int. Cl.² G01N *15/02*
U.S. Cl. 73—61.4 **10 Claims**



10. The method of determining the relative weight proportions of differently sized fractions of a sample of particulate material, which includes the steps of:

a. entraining said particulate material within a conveying fluid while maintaining a unidirectioned net flow of said fluid to an accumulating chamber;

b. intercepting said fractions and temporarily retaining them in discrete zones within the body of conveying fluid while accumulating one fraction at said accumulating chamber;

c. weighing the accumulated fraction;

d. altering the net direction of conveying fluid flow to convey a second fraction to said accumulating chamber; and

e. weighing the accumulated weight of said one and said second fraction.

3,943,755

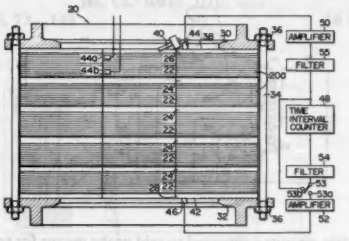
METHOD AND APPARATUS FOR MEASURING THE MAGNITUDE OF A CLAMPING LOAD APPLIED TO A LAMINATED IRON CORE OF AN ELECTRIC MACHINE

Mitsuru Arii, Tokyo; Hideo Kashiwaya, Yokohama, and Kuniharu Uchida, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 22, 1974, Ser. No. 517,026
Int. Cl.² G01N *9/24*
U.S. Cl. 73—67.5 R **10 Claims**

1. A method for measuring the magnitude of a clamping load applied to a laminated iron core of an electric machine

which comprises the steps of introducing a sound wave into the core at one end face thereof and immediately generating a first electric signal; producing a second electric signal when the sound wave propagates through the core and reaches the opposite end face therof; measuring a time interval between the first and second electric signals; dividing a distance between both end faces of the core by the measured time interval to calculate the velocity of a sound wave propagating through the core; and determining the magntiude of clamping load applied to the core from the calculated propagating velocity of a sound wave with reference to previously provided data on a relationship between the magnitude of said clamping force and the corresponding propagating velocity of a sound wave.



3,943,756
WALL INSPECTION DEVICE

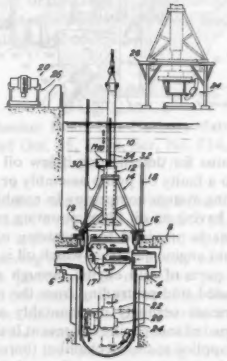
Gilles Aubert, Orsay; Roger Lemoine, Ste Genevieve des Bois; Andre Maury, Orsay; Maurice Moulin, Palaiseau, and Erik Tomachevsky, Paris, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 23, 1974, Ser. No. 499,954

Claims priority, application France, Aug. 27, 1973, 73.30930

Int. Cl.² G01N 29/04

U.S. Cl. 73—67.8 S 12 Claims



1. A device for inspecting at a distance walls which are difficult of access, the device being used inter alia for inspecting cracks, threaded apertures and welds in the walls of a nuclear reactor vessel comprising a detector secured on a movable slide, guide rails secured to a frame B_1 along which the slide moves, probes bearing on a wall being inspected and secured to a plate secured to frame B_1 and parallel to the guide rails, each probe sending a signal proportional to the distance between the guide rails and the place where the probe bears on the wall to be checked, two motors M_1 and M_2 secured to a frame B_2 controlled by electric signals from the probes and each actuating a pinion, the pinions engaging racks secured by pivots to frame B_1 to the two ends of the guide rails, and a potentiometric monitoring device which stops the motors when the signals proportional to the distance between the wall and the guide rails and measured by the probes are equal to one another and to a control valve.

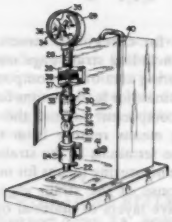
3,943,757
TABLET HARDNESS TESTER AND METHOD OF TESTING

John W. Wilhelm, Jr., Moreland Hills, Ohio, assignor to Skidmore-Wilhelm Mfg. Co., Cleveland, Ohio

Filed Jan. 30, 1975, Ser. No. 545,598

Int. Cl.² G01N 3/10

U.S. Cl. 73—78 1 Claim



1. A molded tablet hardness tester comprising a frame, a source of pressure fluid mounted on said frame, means for controlling said source, a fluid pressure cylinder mounted in a low position on said frame with its axis vertical, a piston reciprocatably mounted in said cylinder with a piston rod extending vertically upwardly therefrom and terminating in an arcuate seat, a pressure fluid line communicating between said source and said cylinder on the lower side of said piston, a check valve in said line permitting flow only toward said cylinder, a normally closed pressure release valve in said line downstream from said check valve, means for optionally opening said pressure relief valve, a pressure transmitting assembly mounted on said frame above said piston rod and vertically in line with said cylinder axis, said assembly including in pressure transmitting relation, from the bottom upwardly, a plunger adapted to have its lower end in contact with a tablet to be tested and its upper end sealed in a load cell and said pressure transmitting assembly including a piston sealed in said cell, a hollow column extending upwardly from said cell, and an upwardly extending pressure transmitting line in said column and in communication with the upper face of said last named piston and filled with hydraulic fluid, and a pressure indicating gauge mounted on said column and connected to said pressure transmitting line and having a resettable maximum register needle, and said assembly mounting including means for vertically adjusting said assembly vertically relative to said frame including a rotatable adjusting wheel having a threaded engagement with said column, a fixed bracket on said frame restricting vertical movement of said wheel, whereby to clamp a tablet for testing lightly between said first named piston rod and said plunger by rotation of said wheel, whereby with a tablet so clamped said fluid pressure source may be actuated to pressurize said cylinder below said first named piston to cause said pressure to be transmitted through said tablet and to be registered on said gauge until said tablet breaks.

3,943,758

DEVICE FOR DETERMINING SURFACE STRAINS DURING THE MEASUREMENT OF INHERENT STRESSES IN STRUCTURAL COMPONENTS OF MACHINES OR APPARATUS

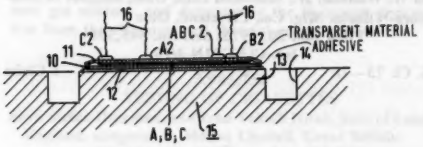
Helmut Wolf, Duisburg-Grossenbaum; Wolfgang Böhm, Mulheim (Ruhr), and Erwin Stücker, Essen-Frintrop, all of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Sept. 9, 1974, Ser. No. 504,092

Claims priority, application Germany, Sept. 7, 1973, 2345309

Int. Cl.² G01B 7/18

U.S. Cl. 73—88.5 R **5 Claims**



1. In apparatus for checking a structural component for inherent stresses including strain gage means for attachment to a surface measuring area of the component, the strain gage means having terminals for leads, means for cutting an annular groove into the component around the area, electrical response measuring means remote from the area, and leads extending from the terminals of the strain gage means to the electrical response measuring means for measuring the change in electrical response of the strain gage means due to the cutting of successive layers of material out of the groove, as indicative of the inherent stress existing prior thereto, the cutting means including a crown boring tool for machining the annular groove around the measuring area, the crown boring tool having a shaft hollow throughout and being mounted in a hollow boring spindle, the terminal leads of the strain gage means attached to the measuring area extending through the crown boring tool and the hollow boring spindle, the improvement therein which comprises a base plate, the strain gage means including a plurality of strain gage strips mounted on said plate, each of said strips having two of the terminal leads, one of the terminal leads of each of said plurality of strain gage strips being connected to a common connecting spot on said base plate, and each of the other terminal leads of said plurality of strain gage strips being respectively connected to separate connecting spots on said base plate; cover plate means superposed on said base plate above said strain gage strips and said terminal leads and formed with openings overlying said connecting spots, and solder deposits respectively extending through said openings and connected with and fixing the position of said terminal leads, said solder deposits simultaneously serving as solder support spots connectible to exterior connecting lines leading to a measuring instrument.

3,943,759

APPARATUS FOR MEASURING COMPRESSION PRESSURES IN INTERNAL-COMBUSTION ENGINE

Takayuki Kato, and Satoshi Yamazaki, both of Aichi, Japan, assignors to Toyota Jidosha Hanbai Kabushiki Kaisha and Kabushiki Kaisha Toyota Chuo Kenkyusho, both of Aichi, Japan

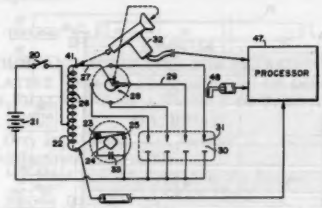
Filed Oct. 31, 1974, Ser. No. 519,779

Claims priority, application Japan, Nov. 5, 1973, 48-124260

Int. Cl.² G01M 15/00

U.S. Cl. 73—115 **20 Claims**

1. An apparatus for measuring a pressure under which the air-fuel mixture is to be compressed during the compression stroke in the combustion chamber of an automobile internal-combustion engine, said apparatus comprising probe means including resistor means for detecting a secondary voltage signal consisting of a capacity discharge voltage signal, an induced discharge voltage signal and a free-oscillating discharge voltage signal from an ignition system, which probe means having one end connected to a secondary terminal of a secondary winding of an ignition coil and the other end connected to a rotor of a distributor which is connected to said secondary terminal of said secondary winding; a plurality



of electric circuits connected to said probe means for selecting only said induced discharge voltage signal from said secondary voltage signal detected by said probe means, electrically processing said induced discharge voltage signal and indicating the value of said induced discharge voltage as the compressed pressure in the combustion chamber in a readable form.

3,943,760

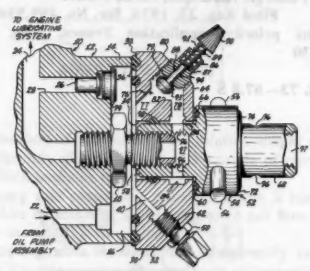
APPARATUS AND METHOD FOR TESTING ENGINE OIL PRESSURE

Marshall T. Allen, 4420 W. Hatcher Road, Glendale, Ariz. 85302

Filed Apr. 4, 1975, Ser. No. 565,141

Int. Cl.² G01M 15/00; G01L 7/00

U.S. Cl. 73—119 R **9 Claims**



3. An apparatus for determining if low oil pressure in an engine is due to a faulty oil pump assembly or due to a faulty engine lubricating system comprising in combination:

a. an engine having an oil filter mounting pad in which an oil chamber is provided for receiving oil from the oil pump of said engine and from which oil is supplied to the lubricated parts of said engine through a hollow externally threaded stud protruding from the mounting pad;

b. adapter means sealingly demountably attached to the mounting pad of said engine to prevent leakage therefrom of the oil supplied to the oil chamber thereof, said adapter means having a passage means formed therethrough for directing oil from the oil chamber of the mounting pad to the lubricated parts of said engine;

c. valve means on said adapter means and in communication with the passage means thereof, said valve means actuatable to selectively close the passage means in said adapter means to temporarily prevent the flow of oil therethrough; and

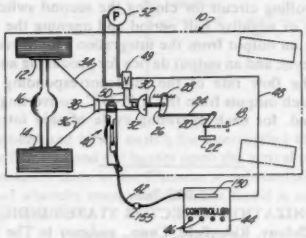
d. pressure indicating means coupled to said adapter means and in communication with the oil chamber of the mount-

ing pad of said engine for sensing the pressure of the oil supplied thereto by the oil pump assembly of said engine.

3,943,761
CABLE TENSION TESTER AND CONTROL SYSTEM

Ralph S. Shoberg, Farmington, and Kenneth R. Kozlowski, Livonia, both of Mich., assignors to GSE, Inc.

Filed Jan. 7, 1974, Ser. No. 431,114
Int. Cl.² G01L 5/10, 1/22
U.S. Cl. 73—144 **10 Claims**



1. A method for adjusting tension in a cable or the like comprising the steps of: contacting the cable centrally of a confined length with a body of high modulus of elasticity material, laterally displacing the confined length of the cable through a predetermined departure Δ from a straight condition by causing displacement of the body, generating an electrical signal representing the stress produced in the body when transmitting a sufficient force required to maintain the displacement, comparing the electrical signal with a reference signal, and adjusting the cable tension until the measured signal is equal to the reference signal.

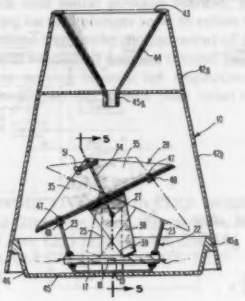
7. A load cell comprising a rigid body of material having a high modulus of elasticity, a pair of spaced parallel bores in the body from an end thereof to define two pairs of opposite flexural areas, a third bore through the body at right angles to the pair of bores and spaced therefrom to define a central area isolated from the load cell body by the flexural areas and said third bore, an input member on the central area for receiving input forces having a component along an axis parallel to the pair of bores, and strain gauge means mounted on the flexural areas and connected to measure the shear force in the flexural areas as a result of said component.

3,943,762
RAIN GAUGE

John Baer, Schooner Head, Bar Harbor, Maine 04609

Filed Oct. 15, 1974, Ser. No. 514,407
Int. Cl.² G01W 1/14
U.S. Cl. 73—171 **8 Claims**

1. In an electronic rain gauge having a fixed base, a bi-stable receiver movable in a repetitive oscillation pattern relative to said base about a pivotal axis between a pair of stable limit positions and having two complementary compartments each operable to be positioned in operative position to collect rainwater when the receiver is in one of the limit positions and to dump collected rainwater in said other limit position, means to collect rainwater and direct it into said receiver compartments alternatively, the rainwater being directed into one of said compartments when said receiver is in one limit position and into the other of said compartments when said receiver is in the other limit position, said compartments being positioned and dimensioned relative to the pivotal axis of said receiver to shift the center of gravity of said receiver from one side of the pivot axis to the other upon accumulation of a predetermined quantity of rainwater in the operative receiver compartment to thereby pivotally displace said receiver from one limit position to the other limit position, said compartment when displaced to its other limit position operable to dump the rainwater collected therein, a recording unit having a counter, fixed sensing means to sense change in receiver position, and means to transmit a signal to said counter in the recording unit upon said sensing, the improvement in which actuator means is mounted on said receiver to cooperate with

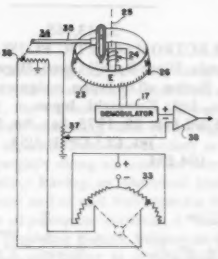


said fixed sensing means, and the receiver is a one-piece molded trough-shaped structure having a medial partition dividing the receiver into two symmetrical compartments and integral structure mounting said receiver on said pivotal axis, said structure extending beyond said axis to provide a support for said actuator means.

3,943,763
MAGNETIC HEADING REFERENCE

Howell D. Garner, Newport News, Va., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Dec. 11, 1974, Ser. No. 531,647
Int. Cl.² G01C 21/00
U.S. Cl. 73—178 R **6 Claims**



1. A vehicle heading reference comprising:

a directional dial mounted on said vehicle so that it can be turned about an axis parallel to the yaw axis of said vehicle;

a magnetometer mounted on said directional dial such that its longitudinal axis coincides with said axis parallel to the yaw axis of said vehicle so that it is rotatable with said directional dial wherein the magnetometer produces an output signal related to the difference between the directional dial setting and the actual heading of said vehicle;

means on said vehicle for generating a signal related to the northerly turning error; and

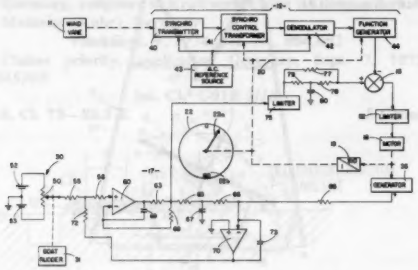
means for subtracting said signal related to the northerly turning error from said output signal produced by said magnetometer whereby the resulting signal is an output signal corrected for the northerly turning error.

3,943,764

SAILBOAT STEERING INDICATOR SYSTEM

Leonard M. Greene, Chappaqua, N.Y., assignor to Safe Flight Instrument Corporation, White Plains, N.Y.

Filed Feb. 12, 1975, Ser. No. 549,381
Int. Cl.² G01C 21/00
U.S. Cl. 73—178 R 13 Claims



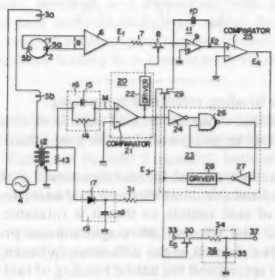
1. A sailboat steering indicator system comprising:
means for sensing the apparent wind direction relative to boat heading and providing a mechanical signal in accordance therewith,
means for converting said mechanical signal to an electrical signal,
means for generating an electrical signal in accordance with changes in boat rudder position from its neutral position and including means for effecting washout of signal components representing steady rudder positions,
means for summing said electrical signals in opposite polarity relationship, the signal in accordance with apparent wind direction being modified to anticipate apparent wind angle changes in response to rudder changes, and
means for providing a wind track reading in accordance with the output of said summing means for use in guiding the steering of said sailboat to a desired heading relative to wind direction.

3,943,765

ELECTROMAGNETIC FLOW METER

Keisuke Takada, Hino; Ryouji Gamo, Higashi Murayama, and Ikuo Sato, Euchu, all of Japan, assignors to Tokyo Shibaura Electric co., Ltd., Kawasaki, Japan

Filed Feb. 20, 1975, Ser. No. 551,325
Int. Cl.² G01F 1/58
U.S. Cl. 73—194 EM 13 Claims



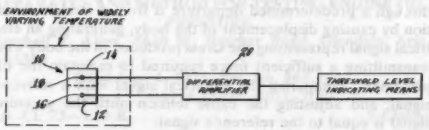
1. An electromagnetic flow meter comprising a pipe for conducting a fluid; a magnetic flux generator for applying an A.C. magnetic flux to a fluid traveling through the pipe; a detection circuit fitted to the pipe so as to generate a detection signal proportional to a product arrived at by multiplying together the inner diameter of the pipe, the density of the A.C. magnetic flux and the running speed of the fluid; a device for generating an A.C. voltage proportional to the A.C. magnetic flux; a first switch supplied with the detection signal; a first switch-controlling circuit for closing the first switch for at least a positive or negative half period of the generated A.C. voltage; an A.C.-D.C. converting circuit for converting said A.C. voltage to a D.C. voltage; a second switch to which an output from said A.C.-D.C. converting circuit is supplied with an opposite polarity to the detection signal; an integration circuit for integrating outputs from the first switch and thereafter integrating outputs from the second switch; a second switch-controlling circuit for closing the second switch after said positive or negative half period and opening the second switch when an output from the integration circuit reaches a referential level; and an output device for producing an output indicating the flow rate of the fluid corresponding to the period in which outputs from the A.C.-D.C. converting circuit are integrated, for each operating cycle of said integration circuit.

3,943,766

FLAME IONIZATION DETECTOR STATUS INDICATOR

Edward B. Delany, Ridgefield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 7, 1975, Ser. No. 556,295
Int. Cl.² G01K 7/02
U.S. Cl. 73—341 11 Claims



1. Flame monitoring apparatus for at least one ionization detector within an environment of widely varying temperature, comprising:
a thermocouple disposed in the flame exhaust passage of each ionization detector;
a thermocouple disposed on the housing of each ionization detector;
a differential amplifier for the outputs from said thermocouples of each ionization detector, each said differential amplifier having the inputs thereof separately connected to the thermocouple outputs; and
means for indicating when the output from any one of said differential amplifiers transgresses a threshold level.

3,943,767

LEVEL DETECTOR SYSTEM FOR CRYOGENIC LIQUIDS

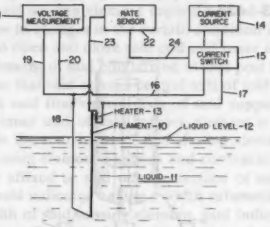
Kenneth R. Efferson, Oak Ridge, Tenn., assignor to American Magnetics, Inc., Oak Ridge, Tenn.

Filed July 22, 1974, Ser. No. 491,155
Int. Cl.² G01F 23/24
U.S. Cl. 73—295 6 Claims

1. A cryogenic liquid level detector system for use with a superconductor filament at least partially submerged in a cryogenic liquid to obtain a voltage signal proportional to the liquid level and to minimize energy input to the cryogenic liquid, which comprises:
a current source for supplying current to the filament and to a heater associated with the filament for producing a normal resistance state in the filament and causing the normal resistance state to progress along the filament to, the liquid level;
voltage measuring means connected across the filament for producing the voltage signal proportional to the liquid level;

a switch connected between the current source and the filament; and

sensing means, responsive to the progression of the normal resistance state along the filament, connected to the



filament and to the switch for interrupting the current to the filament and the heater upon the arrival of the normal resistance state in the filament at substantially the liquid level whereby energy input to the liquid is minimized for any liquid level.

3,943,768

METHOD AND APPARATUS FOR MEASURING PEAK PRESSURE IN FLUIDS

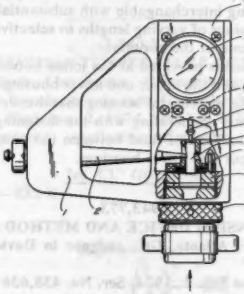
Johann Holst, Schwarzenbek, and Horst Rüsbüldt, Hamburg, both of Germany, assignors to H. Maihak AG, Hamburg, Germany

Filed June 3, 1974, Ser. No. 476,138

Claims priority, application Germany, June 6, 1973, 2328741

Int. Cl.² G01L 7/00

U.S. Cl. 73—396 **8 Claims**



1. Apparatus for determining the highest peak value of fluctuating fluid pressure which varies over time, comprising a housing; indicating means including a plunger mounted in said housing for movement between a starting position and a plurality of indicating positions corresponding to different peak values of the pressure; means for detecting the instantaneous value of the pressure of the fluid and including an actuating element mounted in said housing for displacement in a path between an initial position and a plurality of displaced positions, and an elongated resiliently yieldable element extending transversely to said path and having one end portion fixedly mounted in said housing at a location laterally spaced from said path and a free end portion extending into said path and connected to said actuating element to urge the same toward said initial position so that said actuating element is displaced toward a displaced position as the pressure varies toward the peak value thereof and is displaced toward the initial position as the pressure varies away from the peak value thereof by the action of said yieldable element, said actuating element being operatively connected to said plunger to move the same from said starting position into a respective indicating position and from an indicating position corresponding to a lower peak value into an indicating position corresponding to a higher peak value of the pressure, said actuating element being disconnected from said plunger when the former is displaced towards said initial position thereof; and friction brake means acting on said plunger so as to retain the same in its indicating position during the displacement of said actuating element towards said initial position thereof and to prevent said plunger from moving beyond the respective indicating position corresponding to the highest peak value of the pressure.

3,943,769

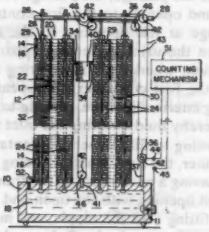
ELECTRIC CONDUCTIVE LAMINATED VESSEL WALL

Eugene Irsai, 163 Greenway South, Forest Hills, N.Y. 11375

Filed Jan. 13, 1975, Ser. No. 540,586

Int. Cl.² G01F 23/00; G01L 7/18

U.S. Cl. 73—401 **8 Claims**



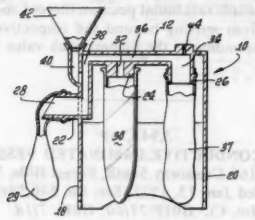
1. A liquid level indicating device comprising in combination: a container vessel substantially enclosable of and containable of a liquid, the container vessel having at least one substantially uprightly extending wall including a series of electrical contacts separate from one-another arranged serially substantially uprightly along an inner surface of the wall, each electrical contact having an electrical lead extending exteriorly of the vessel and of said wall separate from leads of others of the series of electrical contacts, a vessel electrical terminal means for providing electric current to liquid within the vessel such that electricity is conductable therefrom through an upper portion of the liquid into one of said series of contacts in intimate electrically conducting contact with the upper portion of the liquid, electrical power means for providing electricity connected operatively to said vessel electrical terminal means, and a multiple-contact variable selector switch means mounted for intermittent connection in circuit serially electrically through said electrical power means and one of said electrical contacts in the liquid for said series of electrical contacts selectively such that a height of liquid within said container vessel is determinable by observance of which of a higher of said series is conductable of current therethrough and through the respective lead thereof, said upright wall comprising a series of alternate layers of conductive elements and non-conductive elements with the non-conductive elements electrically isolating alternate ones of the conductive elements from one-another, the electrically conductive elements being said series of electrical contacts at inner ends thereof.

3,943,770

MIDSTREAM URINE SPECIMEN COLLECTION DEVICE

Bernard McDonald, 18212 Pacific Coast Highway, Malibu, Calif. 90265

Filed Nov. 6, 1974, Ser. No. 521,352
Int. Cl.² G01N 1/10
U.S. Cl. 73—421 R 10 Claims



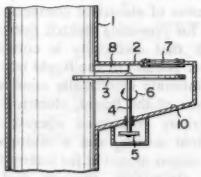
1. Apparatus for collecting a urine sample comprising a frame member having a fluid passage, three containers detachably connected to the frame member, the passage opening into each of the three containers, an inlet member opening downwardly into the passage, the passage at the opening to the inlet member and opening to the first container being lower than the passage at the openings to the second and third containers when the urine collecting apparatus is in normal operative position, whereby fluid entering the inlet member first runs into the first container, the opening to the second container being intermediate the opening to the first and third containers, whereby fluid entering the inlet member runs into the second opening to fill the second container before filling the third container, the first container being of flexible disposable material having a neck portion, the frame having a nipple forming the first opening with the open end of the neck of the first container fitting over the nipple, and means engaging the neck of the container to pinch off the neck under the weight of the fluid added to the first container.

3,943,771

POWDER MATERIAL SAMPLING DEVICE

Makoto Handa, and Hiromichi Hayashi, both of Sapporo, Japan, assignors to Snow Brand Milk Products Co., Limited, Sapporo, Japan

Filed Oct. 15, 1974, Ser. No. 515,060
Int. Cl.² G01N 1/20
U.S. Cl. 73—424 7 Claims



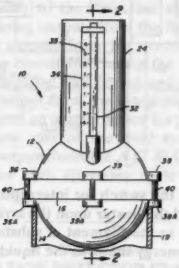
1. In a powder material manufacturing apparatus having a substantially vertical passage for passing manufactured powder material downwardly therethrough, a sampling device for the powder material which comprises a sampling chamber provided adjacent to the vertical passage, a rotatable disc disposed substantially horizontally in said sampling chamber and having a portion projecting into the passage, and means for rotating said disc so that powder material deposited on the projecting portion of the disc can be taken out of the passage into the sampling chamber through rotation of the disc.

3,943,772

CONVERTIBLE MEASURING CONTAINER

William D. Clinton, Tulsa, Okla., assignor to Signet Controls, Inc., Tulsa, Okla.

Filed Oct. 2, 1972, Ser. No. 294,172
Int. Cl.² G01F 19/00
U.S. Cl. 73—429 6 Claims



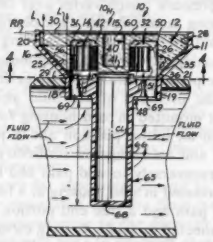
1. A convertible measuring container comprising:
a. an upper housing having the lower end thereof open;
b. a lower housing having the upper end thereof open and the lower end thereof closed, the open upper end of said lower housing having an internal diameter substantially equal to the internal diameter of the lower open end of the upper housing;
c. a central housing removably interposed between the upper and lower housings and having the opposite ends thereof open, said open ends of the central housing having an internal diameter substantially equal to the internal diameters of the open lower end of the upper housing and the open upper end of the lower housing, said central housing being interchangable with substantially identical central housings of varying lengths to selectively vary the overall volume of the container;
d. fastening means provided at the joints between the central housing and the upper and lower housings for removably securing the central housing therebetween; and
e. sealing means cooperating with the fastening means for precluding leakage of fluid between the central housing and the upper and lower housings.

3,943,773

SENSING DEVICE AND METHOD

David L. Fuller, Atlanta, Ga., assignor to David L. Fuller, Atlanta, Ga.

Filed Feb. 1, 1974, Ser. No. 438,636
Int. Cl.² G09F 9/00
U.S. Cl. 73—432 A 5 Claims



1. A sensing device for indicating changes in a certain predetermined condition such as temperature and humidity in a fluid medium comprising:

a fixed support post having a first central axis;

a sensing coil including a spiral wound sensing element having an inner end, an outer end, and a second central axis, said sensing element having a substantially constant width along its length, said sensing element defining an outside surface thereon of said substantially constant width along its length generally parallel to said central axis and said sensing element expanding and contracting in response to changes in the certain condition in the fluid medium to open and close said coil said inner end of said sensing element of said coil affixed to said post to support said coil so that said second central axis of said coil coincides with said first central axis of said support post so that said inner end of said sensing element is relatively fixed while the remainder of said sensing element moves as said sensing element expands and contracts;

an indicator affixed to said outside surface of said sensing element, said indicator having a width substantially equal to the width of said sensing element, said indicator lying within the confines of said outside surface of said sensing element at a prescribed position along the length of said outside surface so that said indicator moves with said sensing element as said sensing coil opens and closes;

an annular optically reflective member fixably carried by said support post concentrically about said first and second central axes outboard of said sensing coil, said optically reflective member defining an annular optically reflective surface thereon concentric about said first and second central axes, said reflective surface laterally aligned with said outside surface of said sensing element and with said indicator, said optically reflective surface defining a prescribed including angle with respect to said first and second central axes so that an optical image of said indicator is generated in a reading plane normal to said central axis; and,

indicia means operatively associated with said optical image of said indicator in said reading plane to quantify the movement of said indicator on said sensing element of said coil.

3,943,774

PRECISION TEMPERATURE CONTROL

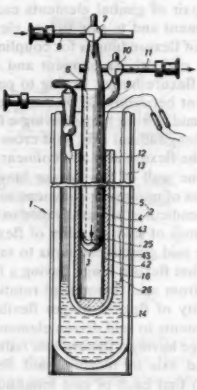
Herwig Pollanz, Linkenheim, Germany, assignor to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Filed Aug. 2, 1974, Ser. No. 494,357

Claims priority, application Germany, Aug. 8, 1973, 2340055

Int. Cl.² G01K *3/02*

U.S. Cl. 73—432 R **10 Claims**



1. Apparatus for giving a gas a predetermined moisture content at a dew point in a temperature range below 0°C, comprising: a first insulated vessel; a cooling trap disposed in said first insulated vessel; a second insulated vessel in which the first insulated vessel is disposed; a mass of liquid coolant partially filling said second insulated vessel; level control means operativelv arranged for maintaining said coolant above a predetermined level in said second vessel, said first insulated vessel being immersed with its lower end into the liquid coolant; means for causing such gas to flow through said cooling trap; and a first thermocouple disposed at the point of gas flow direction reversal in said cooling trap for measuring the dew point temperature of the gas.

3,943,775

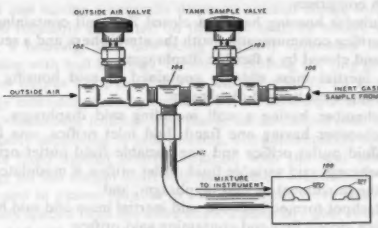
METHOD AND APPARATUS FOR PREDICTING THE EXPLOSIVENESS OF A VOLUME CONTAINING INERT GAS AND HYDROCARBON VAPORS WHEN MIXED WITH AIR

Bruce De Baun, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 461,178, April 15, 1974, abandoned. This application Mar. 24, 1975, Ser. No. 561,569

Int. Cl.² G01N *27/00*; B65D *87/48*, *87/52*

U.S. Cl. 73—432 R **15 Claims**



7. A method of changing the inert gaseous content of a volume containing an inert gas mixture including hydrocarbon vapors to air without producing an explosive mixture of hydrocarbon vapors and air in said volume, comprising:

obtaining a sample of inert gas including hydrocarbon vapors from a volume having an inert gaseous content including hydrocarbon vapors;

mixing said sample with air to form a mixture;

monitoring said mixture as it is being mixed for values including tenths of lower explosive limit and percentage of oxygen;

providing a graph having the tenths of the lower explosive limit of the volume plotted along one edge of the graph and the percent oxygen of the volume along another edge of the graph;

finding a first point on the graph which corresponds with coordinates representing the values of the tenths of lower explosive limit and percent oxygen of said volume;

finding a second point on the graph representing 0.0 lower explosive limit and 21% oxygen;

drawing a straight line through said first point and said second point;

determining if said straight line crosses a vertical line representing the lower explosive limit of said volume;

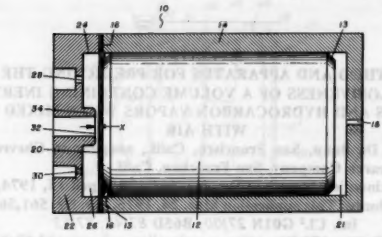
adding inert gas to said volume, and if said straight line intersects said vertical line prior to ventilating said volume with air to remove the inert gas from said volume without producing an explosive mixture of hydrocarbon vapors and air.

3,943,776

FLUIDIC ACCELERATION SENSOR

Albertus E. Schmidlin, Caldwell, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 23, 1974, Ser. No. 535,243
Int. Cl.² G01P 15/02
U.S. Cl. 73—515 4 Claims



1. A fluidic device for sensing acceleration of a missile, which comprises:

a tubular housing having a closed first end containing an orifice communicating with the atmosphere and a second end closed by a flexible diaphragm;

an inertial mass slidably contained in said housing and supported by said diaphragm;

a chamber having a wall including said diaphragm, said chamber having one fixed fluid inlet orifice, one fixed fluid outlet orifice and one variable fluid outlet orifice, wherein said variable fluid outlet orifice is modulated by the movement of said diaphragm; and

a dashpot formed between said inertial mass and said housing closed first end containing said orifice;

whereby when pressurized fluid is introduced through said fixed inlet orifice to pressurize said chamber and said diaphragm and the fluidic device is subjected to an acceleration force, the inertial mass due to said force exerts a counterpressure on said diaphragm, and causes said flexible diaphragm to move and thereby modulate said variable fluid outlet orifice so that the pressure in said chamber, including the output pressure signal from said chamber delivered through said fixed fluid outlet orifice, is proportional to said acceleration force, while said dashpot damps the oscillation of said inertial mass and thereby stabilizes said output pressure signal.

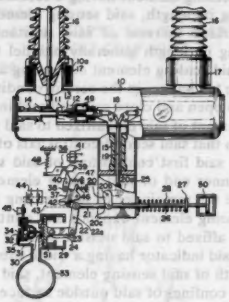
3,943,777

OPERATING APPARATUS FOR CIRCUIT BREAKER

Tuneo Kishi, and Seizo Nakano, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 14, 1974, Ser. No. 497,495
Claims priority, application Japan, Aug. 20, 1973, 48-92507
Int. Cl.² G05G 17/00
U.S. Cl. 74—2 5 Claims

1. A circuit breaker operating apparatus comprising: an operating piston connected to an operating member for operating a breaking section; admission valve means for supplying an operating medium to said operating piston; spring means in which restitutive force is stored during the operation of said operating piston and which delivers the stored restitutive force to said operating member; means for releasing said operating medium acting on said operating piston upon completion of the operation of said operating piston; and holding means including a first lever connected to said operating piston for rectilinear motion and a second lever having an end adapted to be locked by lock means and the other end mechanically coupled to said first lever; said holding means mechanically maintaining the operation-complete state of said operating



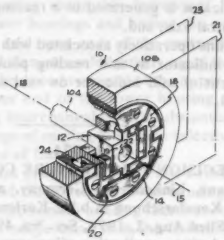
piston and releasing said state at the time when said operating piston is restituted.

3,943,778

MULTIGIMBAL FLEXURE UNIVERSAL JOINT

Stanley F. Wyse, Encino, Calif., assignor to Litton Systems, Inc., Woodland Hills, Calif.

Filed July 1, 1974, Ser. No. 484,433
Int. Cl.² G01C 19/02
U.S. Cl. 74—5 F 33 Claims



1. In a universal joint:

a. a driving element having a first axis of rotation;

b. a driven element having a second axis of rotation;

c. at least a pair of gimbal elements each coupled to said driving element and to said driven element; and

d. a plurality of flexure hinges for coupling each said gimbal element to said driving element and to said driven element, said flexure hinges flexing to permit small angular misalignment between said first and second axes of rotation, each said flexure hinge having a flexure axis, a cross axis and a longitudinal axis, said cross axis being perpendicular to the flexure axis and colinear with a line extending from one wall of the flexure hinge to the other between points of minimum thickness, said longitudinal axis being perpendicular to said flexure axis and to said cross axis, first ones of said plurality of flexure hinges flexibly connecting said gimbal elements to said driving element, each said first flexure hinge having a flexure axis radially extending from said first axis of rotation, second ones of said plurality of flexure hinges flexibly connecting said gimbal elements to said driven element, each said second flexure hinge having a flexure axis radially extending from said second axis of rotation said flexure hinges being oriented so that each of said longitudinal axes forms an angle of substantially the same magnitude with said first and second axes of rotation when said first and second axes of rotation are colinear one with the other.

3,943,779

PRE-SET POSITIONING DEVICE

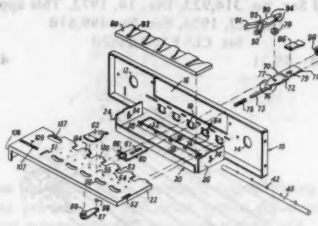
Peter Clifton Ganderton, Tollesbury, England, assignor to Autonnic Limited, Tollesbury, England

Filed Sept. 23, 1974, Ser. No. 508,576

Claims priority, application United Kingdom, Apr. 16, 1974, 16655/74

Int. Cl.[2] F16H *35/18*

U.S. Cl. 74—10.33 10 Claims



1. A preset positioning device comprising a frame, a locator mounted on the frame and movable relative to the frame through a first range of settable positions, the locator having a locator pin mounted thereon and movable therewith, a setting means for moving the locator to set its position, a reference pin mounted on the frame and movable relative to the frame through a second range of positions corresponding to the positions of the first range, and an actuator operable in a first mode to move the reference pin to store a set position of the locator pin and in a second mode to move the locator pin to take up a preset position stored by the reference pin, the actuator having a comparator with two forwardly splayed prongs and an aligning throat at the junction of the two prongs, the prongs being arranged to engage both of the said pins and cam them into the aligning throat.

3,943,780

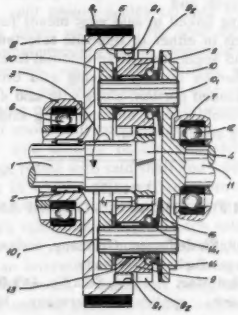
PLANETARY GEAR DRIVE WITH POWER DISTRIBUTION

Hermann Klaue, Tour d'Ivoire 24 e, 1820 Montreux, Switzerland

Filed July 18, 1974, Ser. No. 489,544

Int. Cl. F16h *37/00*, *57/00*, *1/28*

U.S. Cl. 74—15.86 8 Claims



1. A gear drive comprising an input shaft, a toothed sun gear disposed on the said shaft for rotation therewith, a housing about the shaft, a ring gear disposed about the shaft and supported by the housing for rotation relative thereto and for rotation of the shaft relative to the ring gear, said ring gear having internal teeth, planetary gears having teeth which intermesh with teeth of the sun gear and teeth which mesh with teeth of the ring gear, a counter-shaft supporting such planetary gear, said planetary gear being axially slidable on the counter-shaft, an output shaft supported by said housing for rotation relative thereto, means comprising spaced flanges fixed to the opposite ends of the countershafts and to the output shaft supporting the countershafts, a bearing disposed between the countershaft and said planetary gear, resilient means for biasing said planetary gears on the countershaft to cause intermeshing of its teeth with those of the sun gear and ring gear, means for braking the ring gear, said teeth of at least one pair of gears having intermeshing teeth being oppositely obliquely disposed relative to the axes of the gears.

3. In a gear drive comprising a drive gear and a power take-off gear having teeth which mesh with teeth of the drive gear and absorb tooth-forces from the teeth of the drive gear, the improvement wherein the teeth of the drive gear and power take-off and gear are oppositely inclined helical teeth, said power take-off gear is disposed on a shaft for axially movement relative thereto, and resilient means for urging the teeth into intermeshing relationship with the teeth of the drive gear, whereby said power take-of gear is resiliently mounted on said shaft for axial motion when drive gear rotates until the axial components of the peripheral tooth forces of the drive teeth is in equilibrium with the axial components of the peripheral tooth forces of the power take-off teeth.

6. A planetary gear drive for a vehicle comprising a drive shaft, a sun gear fixed to one end of the drive shaft for rotation therewith, an internally toothed ring gear disposed about the shaft and having a centrally disposed annular flange forming a hub rotatably supported on the drive shaft by needle bearings, a housing, said hub being rotatably supported in the housing with ball bearings, means for braking the ring gear, a power output shaft coaxial with the drive shaft, an annular flange extending radially outwardly from the output shaft and fixed thereto for rotation, said flange on the output shaft being rotatably supported in said housing, circumferentially spaced shafts fixed against relative rotation with the said annular flange on the output shaft and having their longitudinal axes disposed in planes parallel to the axis of the drive shaft and radially spaced from the drive shaft, a planetary gear rotatably mounted with needle bearings on each of the flange supported shafts, said planetary gears having inclined power take-off teeth meshing with the internal teeth of the ring gear and axially spaced oppositely inclined drive teeth meshing with the teeth of the sun gear for power take-off, ball bearings about the flange supported shaft disposed against each planetary gear adjacent to the flange on the output shaft, and belleville springs biasing the ball bearings about the flanged supported shafts towards the planetary gears urging the oppositely inclined teeth into engagement whereby because of the opposite inclination of the planetary gear teeth and the biasing action of said springs the planetary gears move axially under load on the flange supported shafts until the axial forces on the drive teeth are at equilibrium with those of the power take-off teeth.

3,943,781

DEVICE FOR TRANSMITTING THE DISPLACEMENT OF A PRESSURE-RESPONSIVE ELEMENT SITUATED IN PRESSURE SPACE

Albert Yakovlevich Jurovsky, ulitsa Baltiiskaya, 4, kv. 94, Moscow, U.S.S.R.

Filed June 11, 1974, Ser. No. 478,337

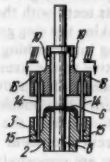
Claims priority, application U.S.S.R., June 18, 1973, 1933175

Int. Cl.[2] F16J *15/50*

U.S. Cl. 74—18.1 7 Claims

1. A device for transmitting the displacement of a pressure-respensive element situated in pressure space confined within a shell, comprising: a base hermetrically held to said shell; said base having a hole; a diaphragm hermetrically held along the external perimeter of said hole; a force-bar having opposite ends, said force-bar passing at the center of said diaphragm and hermetically held therein; one end of said force-bar being

adapted to interact with said pressure-responsive element; the other end of said force-bar serving essentially as the output of the device; a cross-bar provided at said output end of the force-bar; a resilient member, whereby said cross-bar is held to said force-bar; two struts having axes which lie approximately in the same plane with the axis of said diaphragm; said



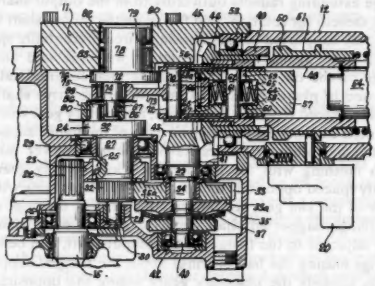
struts having opposite ends, said struts being secured with one of their ends to said base; the other end of said struts being secured to said cross-bar; and a means for varying the position of the axes of said struts relative to the force bar; said means being defined by adjustable stops provided in said cross-bar and adapted to interact with said force-bar.

3,943,782

POWER HAMMER

Tom J. Gloviak, Chicago, Ill., assignor to Skil Corporation, Chicago, Ill.

Filed Nov. 8, 1974, Ser. No. 522,017
Int. Cl.² F16H 21/18
U.S. Cl. 74—50 **8 Claims**



1. In a power hammer of the type which imparts successive hammer blows to the end of a tool element, the improvement comprising:

a. rectilinear guide means;

b. a striker piston mounted by said rectilinear guide means for reciprocal axial movement in a hammer-direction and in a return-direction, said piston serving to impart a hammer blow to a tool element as the former moves in the hammer-direction;

c. a piston actuator mounted for oscillatory movement in a hammer-direction and in a return-direction and lost-motion means connecting said actuator with said piston such that oscillatory movement of the former, imparts the aforesaid axial reciprocal movement to said piston, said lost-motion means permitting limited axial movement of said piston relative to said actuator when the latter reaches the end portions of its stroke of oscillatory movement;

d. a motor having a rotary output member; and

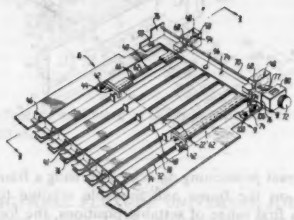
e. mechanical means connecting said rotary output member with said actuator thereby to convert rotary movement of the former into said oscillating movement of the latter, said mechanical means being capable of moving said actuator in its hammer-direction at a velocity which is greater than the velocity of the actuator in its returndirection, whereby said piston is also moved in its hammer-direction at a velocity which is greater than the velocity of the piston in its return-direction.

3,943,783

STOR/.BLE RACK ASSEMBLY

Harold E. Boyer, Anna, Ohio, assignor to Bell and Howell Company, Sidney, Ohio

Division of Ser. No. 314,923, Dec. 14, 1972. This application Aug. 22, 1974, Ser. No. 499,610
Int. Cl.² F16H 29/20
U.S. Cl. 74—89.21 **4 Claims**



1. A rack-and-pinion type linkage system for converting rotary motion into linear motion and thereby moving an object along a linear path said rack-and-pinion type linkage system comprising:

a rack housing, said rack housing defining a chamber, said rack housing further defining a guiding surface located outside, but adjacent to, said chamber and being tangentially disposed to said chamber;

a crown extension spring being unattached to supporting structure along its length, said crown extension spring having a linear extended portion projecting outside said chamber across said guiding surface and being attached to said object at an outer end portion thereof only, and a stored, coiled, portion located in said chamber, said crown extension spring having a series of apertures longitudinally disposed therealong;

a pinion assembly comprising a gear means rotatably mounted on said housing adjacent said guiding surface, but on the opposite side of said spring extended portion from said guiding surface, for driving said crown extension spring, said gear means having teeth which mesh with said apertures; and

a drive means linked to said gear means for rotating said gear means in either of opposite selected directions in response to application of an external force to said drive means, thereby linearly moving said crown-extension-spring extended portion, along with said attached object and selectively coiling and uncoiling said crown-extension-spring coiled portion.

3,943,784

MECHANISM FOR THE ACTUATION OF AN ADJUSTING MEMBER

Ottmar Supper, Sindelfingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 7, 1974, Ser. No. 449,091
Claims priority, application Germany, Mar. 8, 1973, 2311410
Int. Cl.² F16H 21/44
U.S. Cl. 74—110 **20 Claims**

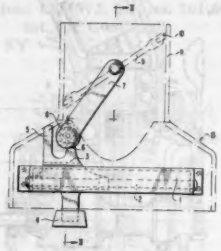
15. An adjusting arrangement comprising:

an adjusting member,

means for rotatably mounting said adjusting member so as to be displaceable between at least a first end position and a second end position,

lever means connected to said adjusting member for selectively displacing the same,

an actuating means for actuating said lever means including a fork member,



means for displaceably mounting said actuating means,

means provided on said lever means for entraining said lever means with said actuating means, and

means for prestressing said means for entraining at one fork of said fork member when said adjusting member is in one of said end positions.

3,943,785

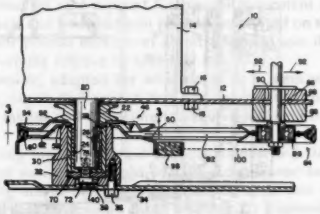
AIR COOLED BELT CLUTCH

Edward K. Percifield, Indianapolis, Ind., assignor to Carlisle Corporation, Cincinnati, Ohio

Filed Apr. 26, 1974, Ser. No. 464,339

Int. Cl.² F16H *7/10, 7/14;* **A01D** *69/08*

U.S. Cl. 74—242.12 **4 Claims**



1. In a drive system including an engine providing a drive shaft, a shell supported by said shaft for rotation relative to said shaft, a split groove pulley on said shaft, said pulley including one flange secured to the shaft for rotation therewith and a complementary flange connected to said shell for rotation therewith, said flanges defining a space axially therebetween, an adjustably movable take-up pulley having a belt-tightening position and a belt-loosening position, and a belt trained about said pulleys whereby, when said belt is tightened by said take-up pulley, said shell and complementary flange rotate with said shaft and said one flange, the improvement in which said one flange provides means for drawing air into said space between said flanges for cooling said belt when said shaft is driven, each said flange including a radially inner annular portion, a radially outer annular portion and an intermediate annular portion therebetween, said belt, in its loosened condition, being engaged with the radially outer annular portion of said complementary flange and out of engagement with said one flange and said belt, in its tightened condition, being engaged with both radially outer annular portions, said air drawing means being positioned to draw air into the space between said intermediate portions, a part of which air escapes from said space radially outwardly to flow between the radially outer portion of said one flange and said belt when said belt is in its loosened condition, thereby to hold said belt out of engagement with said one flange.

3,943,786

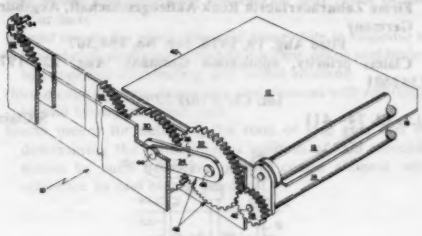
PHOTOGRAPHIC FILM PROCESSING APPARATUS HAVING DISENGAGEMENT MEANS

Loring K. Mills, Hampton, N.H., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 2, 1974, Ser. No. 466,400

Int. Cl.² F16H *35/00, 57/00*

U.S. Cl. 74—384 **13 Claims**



1. Photographic apparatus comprising:

a pair of juxtaposed pressure-applying members including at least one roller adapted to be driven in a predetermined direction for spreading a processing composition across an exposed area of a photosensitive element while simultaneously advancing the element therebetween;

means attached to said one roller for driving said one roller in said predetermined direction;

means for supplying power for rotating said drive means;

means coupled to said power supplying means for transmitting power, received from said power supplying means at an input end thereof, to an output end; and

means for coupling said output end of said power transmitting means to said drive means, said coupling means being mounted for automatic movement between a first position, wherein power received at said output end is transmitted to said drive means for rotation of said roller in said predetermined direction and a second position wherein said coupling means substantially prevents the transfer of power from said drive means to said output end of said power transmitting means during manual rotation of said roller in said predetermined direction.

3,943,787

GEARS

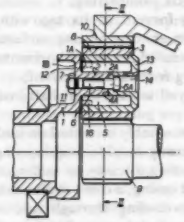
Raymond John Hicks, Llanwrthwl near Llandrindod Wells, Wales, assignor to Vickers Limited, London, England

Filed Apr. 3, 1975, Ser. No. 564,756

Claims priority, application United Kingdom, Apr. 18, 1974, 17150/74

Int. Cl.² F16H *57/00, 1/28*

U.S. Cl. 74—410 **18 Claims**



1. A gear wheel support of composite construction and comprising a gear wheel support sleeve, an internal abutment pillar fast with the gear wheel support sleeve, a carrier, and an abutment pillar protruding from a face of the carrier, the pillar being secured in abutting relationship and together comprising a flexible spindle co-axial with the sleeve, and carrying the

gear wheel support sleeve, this spindle being capable of deflecting elastically, in use of the support, under gear load, there being an annular clearance between the spindle and the sleeve.

3,943,788

PLANAR GEAR TRAIN

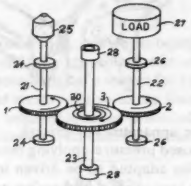
Louis Kümmel, Stadtbergen; Rudolf Morhart, and Erich Polak-Banda, both of Augsburg, all of Germany, assignors to Firma Zahnraderfabrik Renk Aktiengesellschaft, Augsburg, Germany

Filed Aug. 19, 1974, Ser. No. 498,367

Claims priority, application Germany, Aug. 22, 1973, 2342401

Int. Cl.² F16H 57/00

U.S. Cl. 74—411 5 Claims



1. A planar gear train comprising:

a driving spur gear on an input shaft;

a driven spur gear on an output shaft parallel to said input shaft;

an idler gear having teeth in mesh with respective teeth of said spur gears, all said gears lying in a common plane of rotation transverse to said shafts; and

yieldable mounting means for said idler gear enabling limited radial shifting thereof in said plane;

the teeth of said spur gears having flanks engaging the teeth of said idler gear at points of contact each lying on a common diameter of said idler gear and the respective spur gear, the tangents to the flanks of the teeth of said driving and driven spur gears at said pressure points being generally perpendicular to each other.

3,943,789

DRIVE MECHANISM FOR CEMENT MIXER AND THE LIKE

Egon Mann, Friedrichshafen, Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Oct. 3, 1974, Ser. No. 511,678

Claims priority, application Germany, Oct. 4, 1973, 2349894

Int. Cl.² F16H 1/20, 1/12

U.S. Cl. 74—417 6 Claims

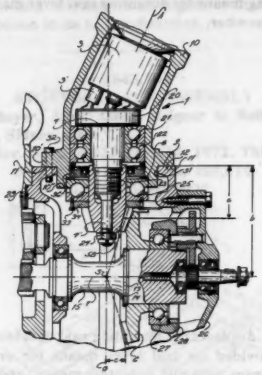
1. A drive mechanism for a load rotatable about a substantially horizontal axis, comprising:

a gear housing formed at its top with an aperture surrounded by an annular seating surface;

a load shaft journaled generally horizontally in said housing and projecting from a side thereof;

a bevel gear keyed to said load shaft inside said gear housing; and

a driving unit detachably mounted on said housing, said unit including a casing outside said housing having a peripheral flange resting directly on said seating surface, a motor inside said casing, a drive shaft positively coupled with said motor extending through said aperture into said housing, a bevel pinion on said drive shaft meshing with said bevel gear inside housing, said drive shaft having a threaded extremity projecting beyond said pinion, said casing and said pinion being provided with extensions forming confronting surfaces in said housing, an antifriction bearing interposed between said extensions, spacing means inserted between said bearing means and one of said confronting surfaces for establishing a predetermined depth of penetration of said pinion into said housing, and fastening means including a nut on said extremity



holding said pinion, said bearing and said spacing means in position.

3,943,790

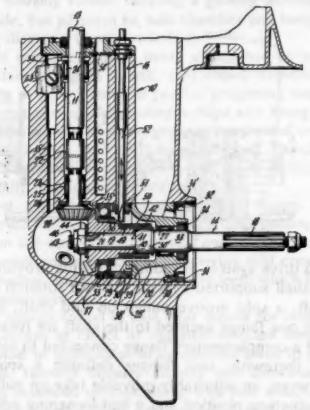
MARINE OUTBOARD GEAR ASSEMBLY

James A. Meyer, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Continuation-in-part of Ser. No. 499,292, Aug. 21, 1974. This application July 9, 1975, Ser. No. 594,538

Int. Cl.² F16H 1/14; B63H 1/14

U.S. Cl. 74—417 14 Claims

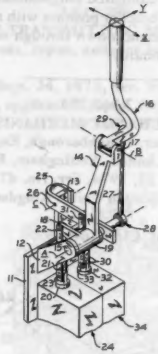


1. A marine outboard gear assembly, comprising a gear case having an upstanding drive bore with a drive shaft mounted for rotation therein, the lower end of said case having a propeller-shaft bore communicating with the lower end of the drive bore and open to the rear of said case, a propeller shaft and means supporting the same for rotation in the propeller-shaft bore and otherwise closing the open end of the propeller-shaft bore, meshing drive and driven gears on said respective shafts, said drive gear being fixed to said drive shaft and said driven gear being rotatably overlapped and axially captive with respect to a portion of said propeller shaft, and one-way-engaging clutch means coacting between said driven gear and said propeller shaft, said clutch means including selectively operable means for effectively enabling and disabling the one-way-engageability thereof, whereby said meshing gears are both driven as long as said drive shaft is driven, and whereby essentially only said driven shaft rotates when the propeller is "windmilling."

3,943,791
SINGLE LEVER CONTROL FOR MULTI-VALVE OPERATION

Robert Casey, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 12, 1972, Ser. No. 261,606
Int. Cl.² G05G 9/02
U.S. Cl. 74—471 XY 13 Claims



1. A single lever control adapted to actuate separate valves comprising

a stationary support

an articulated handle comprising a first arm pivotally mounted on said support for pivotal movement about a first axis and a second arm pivotally mounted on said first arm for pivotal movement about a second axis disposed transversely relative to said first axis,

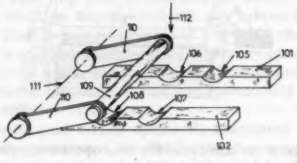
an extension, adapted for attachment to a stem of a first valve, connected to said first arm by interengaging coupling means and extending transversely of said first axis, and

connecting means, adapted for attachment to a stem of a second valve, connected to said second arm, said connecting means being pivotally connected to said support for pivotal movement about a third axis disposed transversely of said second axis and at least generally parallel to said first axis.

3,943,792
METHOD AND DEVICE FOR ASCERTAINING THE STATE OF A GEAR BOX, IN PARTICULAR IN A MOTOR VEHICLE

Jean-Paul Sibeud, Chaponnay (Rhone), France

Filed Aug. 5, 1974, Ser. No. 495,061
Claims priority, application France, Aug. 6, 1973, 73.29271
Int. Cl.² H01H 3/16; G05G 9/12
U.S. Cl. 74—473 R 10 Claims



7. A system for performing a method for detecting the state of a gear box including the steps of controlling the various gear ratios of said gear box by means of movable members, generating binary bits in response to the relative positions of said movable members, all of said binary bits together constituting a coded element, detecting said coded element with reference to a binary standard, and detecting the state of said gear box by determining the instantaneous position of said movable members by such detection of said coded element with reference to said binary standard, said system comprising, in combination:

first means for controlling the various gear ratios of said gear box;

second means for generating said binary bits in response to the relative positions of said first means, all of said binary bits together constituting said coded element;

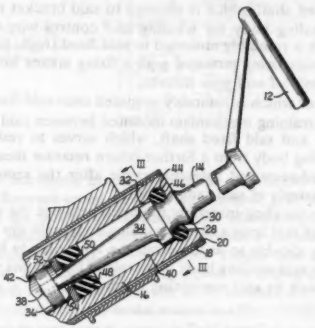
third means for detecting said coded element with reference to said binary standard; and

fourth means for detecting the state of said gear box by determining the instantaneous position of said movable means by such detection of said coded element with reference to said binary standard.

3,943,793
COLLAPSIBLE STEERING WHEEL COLUMN

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 15, 1974, Ser. No. 524,114
Int. Cl.² B62D 1/18
U.S. Cl. 74—492 7 Claims



1. In an energy absorbing collapsible steering column for motor vehicles of the resettable type, a steering wheel drivingly connected to two longitudinally extending, telescopically slidable coacting members, a housing for rotatably receiving one of said coacting members and adapted to be supported by brackets attached to the frame of said vehicle, means for transferring the rotation of one coacting member to the other coacting member, the improvement comprising: means defining opposed annular recesses on said members at their interface; a first resilient means disposed within said annular recesses intermediate said coacting members for retaining said members in a fixed axial disposition with respect to one another until a predetermined disengaging impact load upon said steering wheel; a second resilient means within one of said coacting members for progressively absorbing the energy from said impact force; and a compacting means responsive to relative movement between said coacting members for compressing said second resilient means both axially and radially during an impact force to effect energy absorption, said coacting members being easily resettable to their normal fixed axial disposition with respect to one another by compressing said first resilient means both axially and radially in a direction opposite to the impact load in order to re-engage the first resilient means in the annular recesses of each coacting member; said second resilient means comprising an elastomeric pad having an aperture therein and said compacting means

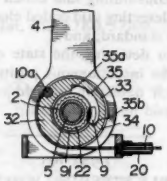
comprising a tapered conical portion receivable in said aperture.

3,943,794

OPERATING MECHANISM FOR A BICYCLE

Shozo Shimada, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed July 25, 1974, Ser. No. 491,643
Claims priority, application Japan, July 31, 1973, 48-86521
Int. Cl.² G05G 5/18
U.S. Cl. 74—501.5 R 10 Claims



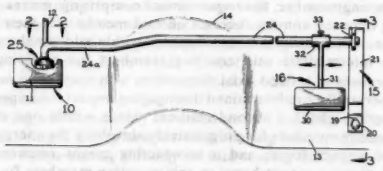
1. An operating mechanism for operating, through a control wire, a derailleur fitted to a bicycle, comprising;
   a. a bracket member secured onto a frame member of the bicycle;
   b. a fixed shaft which is secured to said bracket member;
   c. a winding body for winding said control wire thereon, which is rotatably mounted to said fixed shaft, said winding body being provided with a fixing means for fixing a terminal of said wire thereto,
   d. a lever which is rotatably mounted onto said fixed shaft;
   e. a restraining mechanism mounted between said winding body and said fixed shaft, which serves to restrain the winding body from a further return rotation thereof over a predetermined rotatable range after the same rotates excessively of said range, and
   f. a slip coupling insertibly mounted between the root portion of said lever and said winding body, said slip coupling being slidable so as to permit the lever only to be turned when said winding body is restrained from being rotatably restored by said restraining mechanism.

3,943,795

AUXILIARY AUTOMOBILE BRAKE OPERATOR FOR ACTUATION BY FRONT SEAT PASSENGER

Frank T. Kenney, Fort Lauderdale, Fla., assignor to Collete Love, Fort Lauderdale, Fla.

Filed Apr. 14, 1975, Ser. No. 567,502
Int. Cl.² G05G 1/16
U.S. Cl. 74—562.5 3 Claims



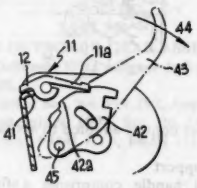
1. In an auxiliary brake operator for acutation from the passenger's side of the front seat of an automotive vehicle which has brakes and a driver's brake pedal unit for operating the brakes, said auxiliary operator having:
   a bracket for attachment to the floor of the vehicle on the passenger's side;
   a rigid linkage rod rotatably supported by said bracket and extending from the bracket laterally over in front of the driver's brake pedal unit and clamped to the driver's brake pedal unit;
   and an auxiliary brake pedal unit on the passenger's side for rotating the linkage rod in a brake-applying direction when the auxiliary brake pedal is depressed;
the improvement wherein:
   said bracket has an upwardly and forwardly inclined base for direct engagement with the inclined floorboard of the vehicle below the dashboard, said base having slots therein which are elongated longitudinally of the base for adjustment of the bracket position with respect to mounting bolts which extend down through said slots and into the inclined floorboard.

3,943,796

GEAR CHANGE MECHANISM

Anthony William Hillyer, Loughborough, England, assignor to Raleigh Industries Limited, Nottingham, England

Filed May 22, 1974, Ser. No. 472,372
Claims priority, application United Kingdom, May 22, 1973, 24501/73
Int. Cl.² F16H 29/00
U.S. Cl. 74—577 S 6 Claims



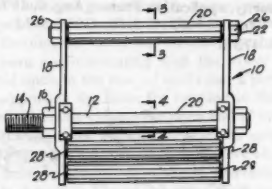
1. A pawl member comprising a pawl body including mounting means adapted for co-operation with a suitable seating for support relative to a ratchet formation for co-operation therewith, at least one pawl tooth extending outwardly from the body and a tail portion extending outwardly from the body for loading the pawl tooth in a predetermined position relative to a co-operating ratchet formation, the said pawl member being moulded as an integral structure from a synthetic plastics material of appropriate elasticity characteristics.

3,943,797

BICYCLE PEDAL

Henry D. Jollie, Clifton, N.J., assignor to Lawrence Pesak Associates, Inc., New York, N.Y., a part interest

Filed Nov. 4, 1974, Ser. No. 520,253
Int. Cl.² B62M 3/08
U.S. Cl. 74—594.4 3 Claims



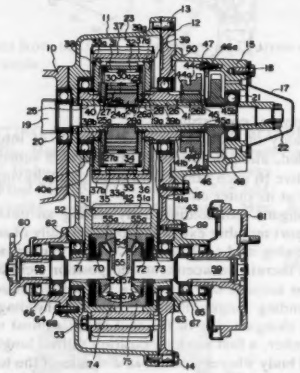
1. A pedal for a bicycle for two operators comprising: an elongated shaft configured for engaging at one end of the crank of a drive mechanism of said bicycle; a pair of generally planar members extending radially respectively from two axially spaced points along said shaft; each of said members having three angularly spaced apart elongated arms radiating

from said shaft; the respective arms of the pair of members being axially aligned; three generally cylindrical tread members axially directed respectively between the free ends of said aligned arms, said arms being of sufficient length to enable the toe of the foot of one of the operators to be inserted radially between one of the treads and the shaft as a stirrup so that said pedal may be simultaneously engaged by a leg of each of the operators in nested relationship, one over the other.

3,943,798
POWER TRANSMITTING MECHANISM

Kenichi Sato, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Sept. 24, 1973, Ser. No. 399,682
Claims priority, application Japan, Oct. 2, 1972, 47-099195
Int. Cl.² F16H 37/06
U.S. Cl. 74—682 **5 Claims**



1. A power transmitting mechanism for a vehicle comprising:

planetary gear means, disposed within a stationary casing of said vehicle and including fixed engaging means thereon, including a sun gear disposed upon an output shaft of a transmission so as to thereby receive a torque output from said transmission, first planetary pinion gears meshed with said sun gear, second planetary pinion gears meshed with said first planetary pinion gears, carriers which are adapted so as to support said first and second planetary pinion gears and a ring gear meshed with said second planetary pinion gears;

change-over means associated with said planetary gear means and said fixed means of said stationary casing for selectively controlling said planetary gear means so as to produce different torque outputs as required, whereby when said change-over means is engaged with said planetary gear means free from said fixed stationary casing means, said ring gear is rotatable in unison with said output shaft to directly transmit the torque from said output shaft to said ring gear, and when said change-over means is engaged with said fixed stationary casing means, said carriers are fixed relative to said output shaft so as to transmit the torque from said sun gear to said ring gear with a different ratio,

a differential gear means opeatively associated with said planetary gear means for distributing the torque output from said planetary gear means to the vehicle wheel drive shafts and including a carrier and a ring gear secured thereto;

a chain interposed between said planetary gear means and said differential gear means;

a sprocket wheel provided upon said ring gear to said planetary gear means and engaged with said chain;

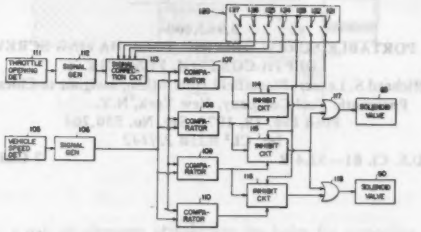
a second sprocket wheel provided upon said ring gear of said differential gear means also being engaged with said chain; and

said ring gear of said differential gear means and said ring gear of said planetary gear means being positioned on respectively parallel axes in a substantially common place plane whereby the torque output from said planetary gear means is transmitted to said differential gear means through said chain.

3,943,799
CONTROLS FOR FOUR-FORWARD-SPEED AUTOMATIC TRANSMISSIONS

Toshimitsu Sakai, and Tadashi Saito, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 440,003, Feb. 6, 1974, abandoned.
This application Feb. 19, 1975, Ser. No. 551,148
Claims priority, application Japan, Apr. 24, 1973, 48-45736
Int. Cl.² B60K 41/18
U.S. Cl. 74—866 **2 Claims**



1. In an automatic transmission for an automotive vehicle of the four-forward-speed type having shiftable gear means for changing the power transmission ratio of said transmission, said gear means being structured to provide a plurality of shift ranges including four forward speed ranges and a reverse range, gear shift means including means for setting a plurality of gear shift ranges and hydraulic servo means for controlling transmission clutch and brake means to effect shifting of said gear means in response to pressure fluid supplied to or drained from said hydraulic servo means, said hydraulic servo means including four hydraulic servo mechanisms for controlling shifting in said forward speed ranges and one hydraulic servo mechanism for providing reverse speed operation, a hydraulic fluid source, and a hydraulic control circuit for controlling flow of pressure fluid to and from said hydraulic servo mechanisms, a control system comprising:

signal generating means for generating electrical signals representative of the operating condition of said vehicle;

logic circuit means responsive to said gear shift means for emitting electrical signals in accordance with the signals received from said signal generating means, said emitted signals being representative of the shift range setting of said gear shift means and of the operating condition of said vehicle;

a manual valve included in said hydraulic control circuit connected for flow communication with said hydraulic fluid source and including first and second port means, and means for selectively communicating said first and second port means with said fluid source;

a first shift valve having said first port means of said manual valve connected thereto, and including a pair of output ports and means for selectively communicating said manual valve first port means with said pair of output ports;

a second shift valve connected to said pair of output ports of said first shift valve, and including a first pair and a second pair of output ports and means for selectively

individually communicating said pair of output ports of said first shift valve with said first and said second pair of output ports of said second shift valve;

means individually connecting each of the ports of said first and second pair of output ports of said second shift valve with one each of said forward speed hydraulic servo mechanisms;

said first and second shift valves operating to selectively supply pressure fluid from said first port of said manual valve to said four foward speed servo mechanisms to perform shifting within said four foward speed ranges in accordance with the shift range setting of said transmission;

shift valve actuating means responsive to said logic circuit means to control operation of said first and second shift valves in accordance with signals emitted from said logic circuit means; and

means for communicating said second port of said manual valve with said one reverse speed hydraulic servo mechanism by way of one of said first and second shift valves so that there may be obtained four forward speeds including a first forward speed capable of providing engine braking at all times and one reverse range.

3,943,800

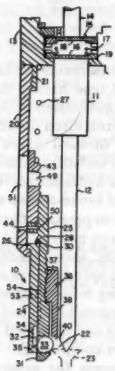
PORTABLE SCREW DRIVING TOOL HAVING SCREW DEPTH CONTROL FEATURE

Richard S. Lesner, Bloomfield Hills, Mich., assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Feb. 18, 1975, Ser. No. 550,264

Int. Cl.² B25B *23/142*

U.S. Cl. 81—52.4 R **7 Claims**



1. A screw driving tool comprising a housing, a screw driving bit supported in the housing so as to follow as a unit with the housing a screw as it is being driven by the bit into a work surface, a slide member supported by the housing for relative axial retractible movement having a normal position projecting axially beyond the housing and the bit and adapted to be retracted into the housing relative to the housing and bit upon being pressed into contact with a work surface, stop means carried by the housing having cooperation with the slide member to limit the extent of retraction of the slide member into the housing, the slide member being a sleeve disposed in the housing in surrounding relation to the bit, and adjustable means for controlling the extent of retraction of the slide member into the housing; wherein the adjustable means includes a travel control nut having threaded engagement with the sleeve and extending in its body axially rearwardly beyond the sleeve, the control nut being selectively operable to increase or decrease the overall length of the combined sleeve and control nut; and wherein the housing includes a side opening allowing access of a tool for making adjustments to the control nut.

3,943,801

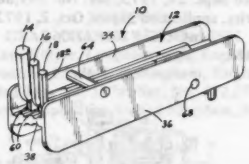
TOOL SET WITH SLIDE-OUT AND SWING-OUT TOOLS

Harmon P. Yates, P.O. Box 511, Longview, Wash. 98632

Filed Feb. 24, 1975, Ser. No. 552,697

Int. Cl.² B25B *13/48*

U.S. Cl. 81—71 **13 Claims**



1. A tool set comprising

a plurality of tools, each having a pair of integrally connected, elongate shanks disposed at a substantial angle relative to each other, with each shank having a working part at its outer end,

an elongate tool-holding body having an elongate shank support member extending longitudinally of said body for receiving said tools and permitting manual shifting of a tool therein between a stored position held adjacent the other tools in said set with a shank thereof adjacent and extending longitudinally of said tool-holding body with one elongate side of the tool shank against said support member, a first working position shifted longitudinally of said body whereby one of said shanks of the tool is spaced from the body with its associated working part exposed, and a second working position wherein the other shank of said tool is shifted outwardly from said body and from said other tools to expose its associated working part, and

holding means in said body for holding a tool in a selected position comprising a pivot member secured to said body and spaced outwardly from said shank support member, about which pivot member said tool is swingable to place said tool in its second operating position with said other tool shank extending outwardly from said shank support member and its one shank captured between said pivot member and shank support member.

3,943,802

MULTIPLE TOOL TURRET

Harry Paul E. Luebkemann, and David Bradford Wood, III, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jan. 9, 1975, Ser. No. 539,623

Int. Cl.² B23B *3/00, 29/00, 7/00*

U.S. Cl. 82—2 R **3 Claims**

1. In a machine tool, the combination comprising:

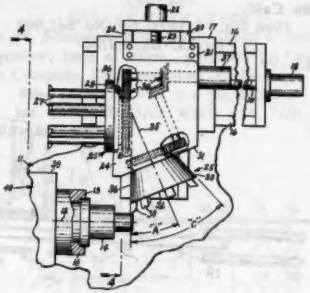
a. a frame;

b. a work spindle rotatably mounted on said frame for carrying a workpiece to be machined;

c. a slide, including a lower carriage reciprocably mounted on said frame substantially parallel to the axis of said work spindle, and further including an upper carriage reciprocably mounted on said lower carriage substantially radial to the axis of said work spindle; and

d. a tool support mounted on said upper carriage carrying two rotatably mounted turrets, each of which is provided with a plurality of tool holders, wherein one of said turrets is nearest the work spindle face measured along an axis

parallel to the work spindle axis and carries internal turning tools and further wherein the other of said turrets



is farthest from the work spindle face and carries external turning tools.

3,943,803

MOUNTING ARRANGEMENT FOR A SPINDLE

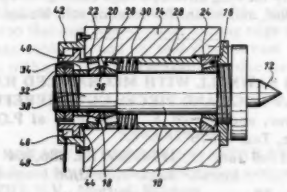
Dietmar Hafla, Hohengehren, Germany, assignor to Index-Werke KG Hahn & Tesky, Esslingen, Germany

Filed Mar. 5, 1975, Ser. No. 555,624

Claims priority, application Germany, Mar. 6, 1974, 2410540

Int. Cl.² B23B *19/02*

U.S. Cl. 82—30 **15 Claims**



1. A mounting arrangement for a spindle which is subject to axially directed forces, comprising support means; at least two longitudinally spaced and axially adjustable anti-friction bearings on said support means and each having an inner and outer race; a spindle rotatably journalled in said bearings and having one end adjacent one of said bearings, said spindle being subject to the action of axial forces acting upon said one end in direction toward an other end of the spindle which is adjacent the other of said bearings; pressure-exerting means adjacent said other end and operative for exerting upon said other bearing a counter force acting in direction towards said one end and tending to shift said spindle counter to said axial forces; and transmitting means for transmitting said counter force to said one bearing for axially adjusting the same relative to said spindle in accordance with the shifting of said spindle.

3,943,804

SPRING-LOADED LIVE CENTER

Francis Wolski, South Hadley, Mass., and Alan A. Zaremskas, 14, both of East Hartford, Conn., assignors to Omer H. Schook and Alan A. Zaremskas, both of East Hartford, Conn., part interest to each

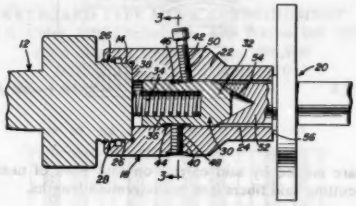
Filed June 21, 1974, Ser. No. 481,914

Int. Cl.² B23B *23/04*

U.S. Cl. 82—33 R **1 Claim**

1. An adapter for converting a ball bearing live center to a spring-loaded live center, comprising, in combination:

a. a hollow locating housing arrangeable onto a live center;
b. said housing having a workpiece locating end face;
c. a center provided with a recess and slidably arranged within the hollow housing;
d. a spring arranged within the recess of the center and extending therefrom for abutting the live center;
e. a pair of holes diametrically opposed to each other provided in the housing and communicating with the central bore of the housing;
f. a longitudinal groove provided in the center and arranged for matching with one of the holes:
g. a wedge-shaped groove provided in the center and arranged for matching with the other of the holes when the longitudinal groove matches the one of the holes;



h. a pair of elements arranged in the holes for projecting into the grooves, one of the elements projecting into the longitudinal groove for limiting the length of travel of the center in the bore relative to the housing, and the other of the elements projecting into the wedge-shaped groove for locking the center in a predetermined position relative to the housing; and
i. the housing is provided with a counterbore arranged for fitting over a boss-like end of the live center which forms a live center locating diameter, and with thread means arranged in the counterbore for engaging with cooperating locating diameter threads, the locating diameter forming a face against which the spring abuts.

3,943,805

METHOD AND APPARATUS FOR THE PRODUCTION OF STAPLE SLIVERS FROM TOWS OF FILAMENT FIBERS

Wolfgang Lubitzsch, Lubeck-Gr. Steinrade, Germany, assignor to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany

Filed Feb. 5, 1975, Ser. No. 547,257

Claims priority, application Germany, Feb. 5, 1974, 2405474

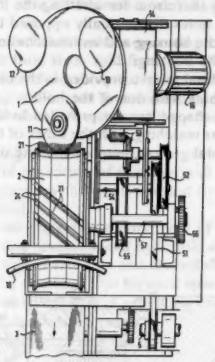
Int. Cl.² D01G *1/04*

U.S. Cl. 83—23 **18 Claims**

1. An apparatus for producing predetermined lengths of fibers from an endless tow of fibers comprising:

a. a carrier;
b. means for moving said carrier in a first direction;
c. transverse rows of needles carried on said carrier;
d. said transverse rows of needles being positioned on said carrier at an angle relative to said first direction of movement of said carrier;
e. means for continuously depositing said endless tow of fibers on said transverse rows of needles in a path parallel to said first direction of movement of said carrier;
f. a rotating cutting blade, and

g. means for repeatedly moving said rotating cutting blade substantially transverse to said tow of fibers as said fibers



are moved by said carrier on said rows of needles for cutting said fibers into predetermind lengths.

3,943,806

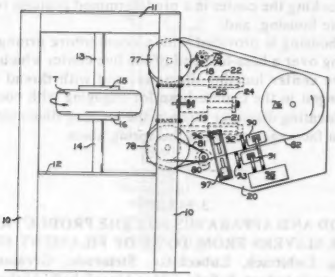
TIRE TRUING MACHINE

Mathew Kuts, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 21, 1975, Ser. No. 551,891

Int. Cl.² B23B 5/14; B29H 21/08

U.S. Cl. 82—49 **26 Claims**



8. A tire truing machine comprising support means, chuck means mounted on said support means for supporting a tire for rotation about a central axis, motive drive means connected to said chuck means for rotating said chuck means and a tire mounted thereon about said central axis of rotation, a circular endless band saw mounted on said support means, drive means connected to said band saw for driving said band saw through an orbital path, tool support means mounted on said support means, said tool support means having guide means thereon for engaging a portion of said band saw to guide said band saw in a portion of its orbital path to trim the outer peripheral surface of a tire rotated by said chuck means, cam means operatively connected to said guide means for shaping said guide means into a predetermined curvilinear pattern for guiding that portion of the orbital path of said band saw for cutting a tire.

3,943,807

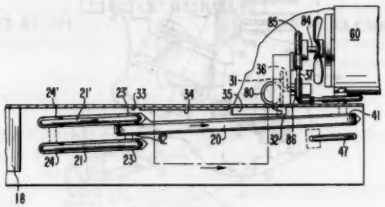
AUTOMATED ENVELOPE OPENER

George H. Bingham, Los Altos, and Edward A. Krupotich, Palo Alto, both of Calif., assignors to Omation Corporation, Palo Alto, Calif.

Filed Jan. 14, 1975, Ser. No. 541,007

Int. Cl.² B26D 1/20

U.S. Cl. 83—79 **10 Claims**



1. An envelope opening machine comprising conveyor means for transporting an envelope along a linear path to a cutting station, bias means for constraining an edge of said envelope to assume an orientation parallel to a reference plane at said cutting station, cutting means disposed adjacent said path, said cutting means comprising a plurality of blades which are parallel to said reference plane at said cutting station, said blades being rotatable in a plane perpendicular to said reference plane and being disposed inside a housing to contact said envelope edge at said cutting station, said housing being apertured so that the rotation of said blades causes air to be drawn into said housing thereby causing an air draft for automatically blowing envelope edge cuttings away from said cutting station, and means for rotating said blades.

3,943,808

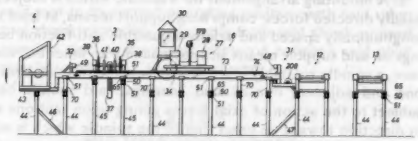
MODULAR SAWMILL WITH MECHANIZED HANDLING OF SAWLOGS AND PIECES CUT THEREFROM

Roy R. Pryor, and Harold A. Pryor, both of P.O. Box 26, Woodville, Tex. 75979

Filed June 19, 1974, Ser. No. 480,964

Int. Cl.² B26D 7/06, 5/06

U.S. Cl. 83—88 **17 Claims**



1. An improved modular sawmill comprising

a platform assembly composed of a plurality of vertical supporting members spaced in ranks and files and a plurality of longerons each horizontally disposed on one of said files of supporting members for forming a vertical supporting frame structurally independent of said other vertical supporting frames and further establishing at different preselected elevations a plurality of vertically spaced horizontal operating planes bisected by a vertical cutting plane,

a carriage and saw section removably mounted on a plurality of said longerons at a selected one of said operating planes for receiving and longitudinally slicing a sawlog longitudinally arranged in said cutting plane, and

a self-contained nose section removably mounted on and straddling a plurality of said longerons at said selected one of said planes and operable independently of said carriage and saw section to receive and laterally position

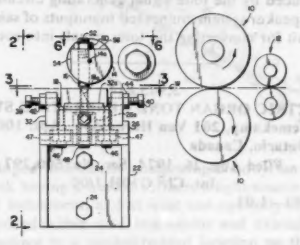
a sawlog and the like longitudinally in said cutting plane for engagement by said carriage and saw section.

3,943,809

ROTARY TAB CUTTER

Lawrence W. Schoppee, Springfield, Alfred D'Antonio, East Longmeadow, both of Mass., assignors to Package Machinery Company, East Longmeadow, Mass.

Filed June 17, 1975, Ser. No. 587,643
Int. Cl.² B23D *25/02*; B26D *1/56*, *7/20*
U.S. Cl. 83—311 10 Claims



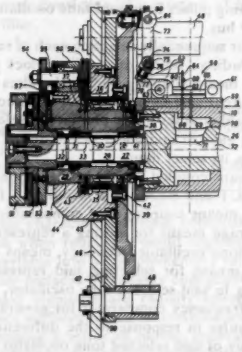
1. A device for cutting a tab from a continuously moving web, said device comprising a fixed female die below the path of movement of the web and having a flat face which defines an outwardly open slot having a U-shaped cutting edge so oriented with respect to the web path that the legs of the U extend downstream in the direction of movement of the web, the base of the U being arcuate, a movable punch die of cylindrical configuration and defining at least a semi-circular cutting edge at one end, means rotatably supporting said punch die so that said semi-circular cutting edge moves downwardly into said slot and in said downstream direction to cooperate with said arcuate fixed cutting edge for shearing the web.

3,943,810

ROTARY PERFORATING APPARATUS

Wilfried Edgard Muylle, Schoten, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Aug. 2, 1974, Ser. No. 494,337
Claims priority, application United Kingdom, Aug. 3, 1973, 36897/73
Int. Cl.² B26D *1/56*
U.S. Cl. 83—337 7 Claims



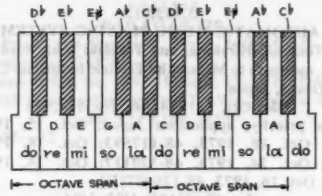
1. Rotary perforating apparatus for perforating an advancing web, comprising a frame, a rotatable web-supporting wheel mounted on said frame for supporting a section of the web during its advance, a plurality of web punch assemblies, each including a punch carrier arm pivoted in a radial plane of the wheel, a punch on said arm, and a die for receiving said punch, arranged in spaced side-by-side relation in series around the periphery of said wheel, said means operative during rotation of said wheel to pivot the punch carrier arms of the successive perforator assemblies towards the web-supporting wheel to perforate successive sections of the web supported on said wheel, said means comprising a control member mounted on said frame for rotation with and at the same angular speed as the web-supporting wheel, and a control arm for each web punch assembly, each control arm being pivotally connected at one end to said control member and at the opposite end to the corresponding punch carrier arm, the points of pivotal connection of said control arms to said control member being arranged in a circle which is eccentric with respect to the axis of rotation of said web-supporting wheel.

3,943,811

KEYBOARD TYPE MUSICAL INSTRUMENT

Donald K. Coles, 2505 Capitol Ave., Fort Wayne, Ind. 46806

Filed Aug. 12, 1974, Ser. No. 496,806
Int. Cl.² G10C *3/12*; G10H *1/00*
U.S. Cl. 84—1.01 4 Claims



1. An electrically keyed musical instrument having:

a keyboard containing a total of at least 25 digitals, including at least 15 lower digitals and at least 10 upper digitals, each upper digital activates at least one upper digital switch, each lower digital activates at least one lower digital switch,

a plurality of tone generator circuits tunable in a twelve tone scale with 12 semitones per octave,

scale selecting means having a plurality of operating states, providing electrical connections with said tone generator circuits and said digital switches such that pitches activated by said digitals always increase when proceeding from left to right on the keyboard, wherein the improvement comprises:

at least one of said operating states of said scale selecting means provides five lower digitals per octave span playing the tones of a pentatonic scale, and at least two upper digitals per octave span playing tone intermediate to the tones of said pentatonic scale.

3,943,812

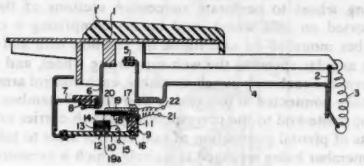
TOUCH RESPONSIVE SENSOR IN ELECTRONIC KEYBOARD MUSICAL INSTRUMENT

Yohei Nagai, and Masatada Wachi, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 1, 1974, Ser. No. 520,225
Claims priority, application Japan, Nov. 2, 1973, 48-123760
Int. Cl.² G10H *1/02*, *5/02*
U.S. Cl. 84—1.1 11 Claims

1. A touch responsive sensor for obtaining electric signals in accordance with the movement of each key in an electronic musical instrument, comprising first and second electrodes of electrically conductive material spaced apart from each other, an intermediate electrode of electrically conductive material

interposed between said first and second electrodes and electrically insulated from each of said first and second electrodes by a dielectric, means for maintaining said intermediate electrode adjacent said first electrode, said intermediate electrode being reciprocatively operable by the key and movable from near said first electrode toward said second electrode, producing variations of capacitance therebetween, the movement of said intermediate electrode generating a first touch responsive controlling signal in accordance with the variation of capacitance produced between said first and intermediate electrodes and a second touch responsive controlling signal in accordance with the variation of capacitance produced between said second and intermediate electrodes.



3,943,813

AUTOMATIC MUSIC PLAYING SYSTEM

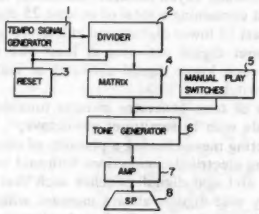
Haruto Teshima, Hirakata, and Toshiaki Inui, Nara, both of Japan, assignors to Matsushita Electric Industrial Company, Ltd., Osaka, Japan

Filed Oct. 7, 1974, Ser. No. 512,954

Claims priority, application Japan, Oct. 15, 1973, 48-116046; Oct. 18, 1973, 48-117593; Oct. 18, 1973, 48-117594; Oct. 24, 1973, 48-120117; Oct. 24, 1973, 48-120118; Oct. 16, 1973, 48-120407[U]

Int. Cl.² G10H *1/02, 5/04*

U.S. Cl. 84—1.03 **5 Claims**



1. An automatic music playing system comprising:

a tempo signal generating circuit for generating a pulse signal determining the tempo of an automatically played rhythm;

a frequency divider circuit including a plurality of flip-flop circuits having output terminals in cascade connection with said tempo signal generating circuit for dividing the frequency of the pulse signal of said tempo signal generating circuit;

a matrix circuit connected to the output terminals of said plurality of flip-flop circuits and having output terminals for generating a plurality of driving signals of predetermined patterns;

a plurality of tone signal generating circuits connected to the output terminals of said matrix circuit for producing tone signals for rhythm sounds of musical instruments based on the driving signals from the matrix circuit;

a voltage source;

a plurality of manual play switch circuits provided between said matrix circuit and corresponding tone generating circuits, each said manual play switch circuit comprising means having an off-state to allow the driving signal from the matrix circuit to trigger the corresponding tone signal generating circuit, an on-state for clamping the matrix output to prevent the driving signal from triggering the tone signal generator circuit, and a momentary on-off state to provide a manually generated trigger signal for said tone signal generating circuit, each switch circuit comprising a series-connected manual switch and capacitor connected in parallel with an output of said matrix circuit, and a resistor connected between said voltage source and the junction of said manual switch and said capacitor;

an amplifier circuit connected to outputs of said tone signal generating circuits for amplifying and mixing tone signals produced by the tone signal generating circuits; and

a loudspeaker system connected to outputs of said amplifier circuit for converting the tone signals into sound waves.

3,943,814

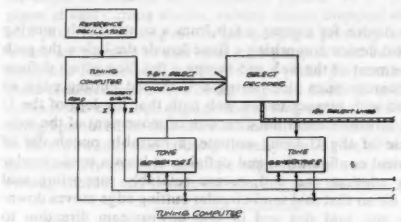
ELECTRIC ORGAN TONE GENERATING SYSTEM

Henry Wemekamp, 201 Van Horne Ave., Apt. 1009, Willowdale, Ontario, Canada

Filed Aug. 26, 1974, Ser. No. 500,297

Int. Cl.² G10H *1/00*

U.S. Cl. 84—1.01 **8 Claims**



1. Apparatus for generating a multiplicity of tones as required in an electronic organ comprising

a. a plurality of free running tone oscillators for producing each of said required tones, each of said tone oscillators including means for controlling the frequency thereof in response to a stored control voltage, means for altering said control voltage in response to a CORRECT pulse present on a CORRECT bus, a gate coupling said CORRECT bus to said control voltage altering means, a select input coupled to said gate for enabling said gate to pass pulses from said CORRECT bus to said control voltage altering means, a second gate coupled to said select input for enabling pulses from said tone oscillator to appear on a READ bus,

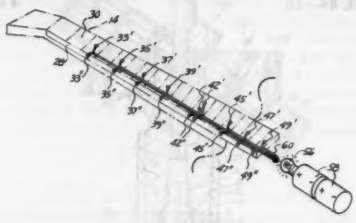
b. means for sequentially selecting each of said tone oscillators, including a source of auxilliary clock pulses, a binary counter, means coupling said clock pulses to said counter to increment said counter, means for decoding the content of said counter into a plurality of select lines, means coupling each of said select line to one of said tone oscillators via its select input,

c. logic means coupled to said selection means and to said CORRECT and READ bus including a frequency comparator, means coupling said comparator to said READ bus, storage means for storing a representation of each desired tone oscillator frequency, means coupled to said storage means for selecting said representation corresponding to said selected tone oscillator, means coupled to said frequency comparator for generating said CORRECT pulse in response to the difference between the frequency of said selected tone oscillator and said representation selected from said storage means, means coupling said CORRECT pulse generating means to said CORRECT bus.

3,943,815
ILLUMINATED GUITAR

Clifford W. Gilbert, Flint, Mich., assignor to Gilbert Guitars, Inc., Flint, Mich.

Filed Nov. 4, 1974, Ser. No. 520,557
Int. Cl.² G10D 1/00, 1/08, 3/06
U.S. Cl. 84—293 16 Claims

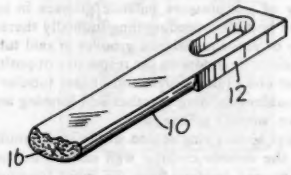


1. A stringed instrument comprising a body, an optically opaque neck having a fretted surface, a light source disposed within said instrument, and at least one optically conductive strand disposed within said instrument and extending from said light source to a predetermined location on the fretted surface of said neck to provide a point of light on said opaque neck.

3,943,816
GUITAR NECK

Daniel R. Goursau, San Francisco, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 12, 1975, Ser. No. 576,601
Int. Cl.² G10D 3/00
U.S. Cl. 84—293 3 Claims



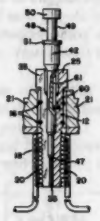
1. A guitar neck consisting of a mixture of an epoxy resin and a powder filler.

3,943,817
SPLIT BOLT

Richard C. Mess, Washington Township, Montgomery County, Ohio, assignor to The Dayton Sure-Grip & Shore Company, Miamisburg, Ohio

Filed Nov. 25, 1974, Ser. No. 526,583
Int. Cl.² F16B 35/02, 13/10; B66F 11/00
U.S. Cl. 85—1 S 9 Claims

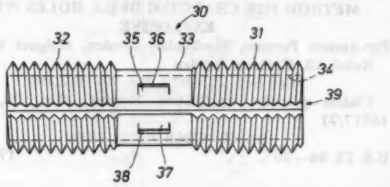
1. A bolt of the character described, comprising plural bolt segments which when radially brought together render said bolt readily insertable into a complementary threaded recess, which have outer surfaces threadably engageable with such a recess when said segments are radially spaced apart, and which have inner surfaces which in combination form a central bore comprising a series of plural, generally cylindrical sections of uniformly decreasing cross-sectional diameter defining female camming surfaces, and an elongated wedge member insertable between said segments to space said segments radially into such threadable relation, said wedge member having a head end, means limiting insertion of said wedge member to a position wherein said head end thereof extends a predetermined longitudinal distance from the upper ends of said segments, and a body portion of a series of plural generally cylindrical sections defining male camming surfaces between said sections whereby when said wedge member is inserted between said segments, said wedge steps will cam against segment steps causing said segments to be spaced apart radially and uniformly along the length of the segments.



3,943,818
RAILROAD TIE

Roy R. Pryor, and Harold A. Pryor, both of P.O. Box 26, Woodville, Tex. 75979

Division of Ser. No. 179,719, Sept. 13, 1971, Pat. No. 3,813,038. This application Feb. 7, 1974, Ser. No. 440,474
Int. Cl.² F16B 23/00
U.S. Cl. 85—42 11 Claims



1. An improved fastening device for securing two timbers or the like together to form a single strength member, comprising

a hollow bolt means having external oppositely-directed threads on each end and a non-threaded center section adapted to receive and rotatably engage a turning means inserted therein through one of said ends of said bolt means,

said bolt means further being resiliently compressible to be inserted into a pre-drilled hole in one of said timbers smaller in diameter than the normal diameter of said bolt means.

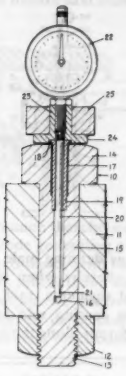
3,943,819
TENSILE MEMBER WITH TENSION INDICATING MEANS

Charles S. Charron, 1607 Watersedge Road, Clarkson, Ontario, Canada

Filed Aug. 22, 1974, Ser. No. 499,550
Int. Cl.² G01D 21/00
U.S. Cl. 85—62 8 Claims

1. A tensile member comprising an elongated body having an intermediate body portion of uniform cross section defining a measuring region, the body being formed with an open-ended longitudinal bore extending through the measuring region, a tubular sleeve extending along the bore, a test rod extending along the bore and through sleeve, said sleeve and test rod being secured to the body at respective longitudinally

spaced positions within said measuring region, said sleeve and test rod each having a free end adjacent the open end of the bore and providing an end face, said end faces providing a



reference for measurement of elongation of the intermediate body portion whereby changes of tensile load on the tensile member can be determined.

3,943,820

METHOD FOR CHARGING DRILL HOLES WITH EXPLOSIVE

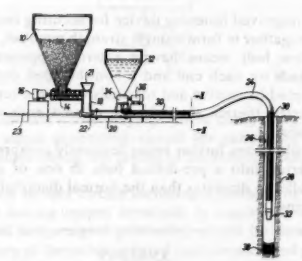
Per-Anders Persson, Stockholm, Sweden, assignor to Nitro Nobel AB, Gyttorp, Sweden

Filed Dec. 21, 1972, Ser. No. 317,195

Claims priority, application Sweden, Dec. 30, 1971, 16917/71

Int. Cl.² C06B *19/00, 19/04*

U.S. Cl. 86—20 C **17 Claims**



1. A method of charging a drill hole with an explosive mixture having a solid component and a liquid component, comprising

using a stream of compressed air to conduct the solid component into the drill hole and simultaneously delivering the liquid component into the drill hole at the same point as the solid component while maintaining the two components entirely separated from one another until they are delivered into the interior of the drill hole so that they are mixed with one another only when both are in the drill hole.

3,943,821

CARTRIDGE CHAMBER FOR AUTOMATIC FIREARM

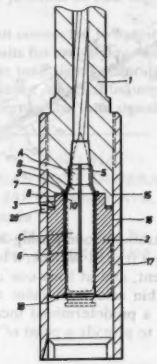
Paul Seifried, Badenweiler, Germany, assignor to Rheinmetall GmbH, Germany

Filed July 2, 1973, Ser. No. 375,839

Claims priority, application Germany, July 4, 1972, 2232679

Int. Cl.² F41F *17/06*

U.S. Cl. 89—16 **4 Claims**



1. In an automatic firearm having a breech mechanism, with a cartrige chamber having a bullet chamber portion formed in the inner end of the barrel and a powder chamber portion adjacent thereto, and a conical transition portion therebetween serving as a stop for the cartridge, said transition portion being provided with gas pressure balance grooves, the improvement comprising:

a tubular member forming said powder chamber portion mounted adjacent to the inner end of the barrel of said firearm and bearing thereagainst;

a plurality of gas pressure balance grooves in said bullet chamber portion extending longitudinally thereof;

a plurality of pressure balance grooves in said tubular;

opposing inner shoulders on the respective opposing ends of the inner end of said barrel and of said tubular member, said shoulders defining together and forming an interiorally open annular groove; and

a cylindrical sealing ring seated within said annular groove against the outside circular wall surface thereof in outwardly spaced relation from the inner longitudinal surfaces of the inner end of said gun barrel and the adjacent end of said tubular member to thereby provide an annular space for the distribution of powder gasses flowing from said pressure balance grooves in said bullet chamber portion to said pressure balance grooves in said tubular member.

3,943,822

TOOTHED TOOL HAVING CUTTING EDGES ON THE TOOTH SURFACES

Herbert Loos, Munich, Germany, assignor to Carl Hurth Maschinen und Zahnradfabrik, Munich, Germany

Filed Jan. 27, 1975, Ser. No. 544,045

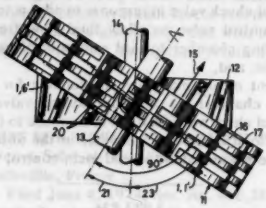
Claims priority, application Germany, Jan. 30, 1974, 2404279

Int. Cl.² B23F *19/06;* B26D *1/12*

U.S. Cl. 90—1.6 A **9 Claims**

1. In a machine tool having a toothed tool wherein the tooth surfaces each have grooves extending from the tooth addendum to the tooth dedendum for forming cutting grooves for shaving of gears on a machine and wherein the tool spindle is rotated relative to the workpiece spindle as seen from the tool to the workpiece along the common perpendicular to the

cross axes, the improvement comprising a plurality of selected circumferentially spaced first teeth on said tool, each pair of selected first teeth having a plurality of second teeth therebetween, the spacing between said selected first teeth being equal to the number of teeth of the workpiece times an integer, said cutting grooves on said selected first teeth being



arranged on said selected first teeth to define a helix which, when viewed in a direction looking toward said workpiece along said common perpendicular, forms an angle with respect to the workpiece axis whose complement is less than the angle formed with respect to the workpiece axis by the tool axis, the cutting edges in said cutting grooves on said second teeth being out of alignment with said helix.

3,943,823

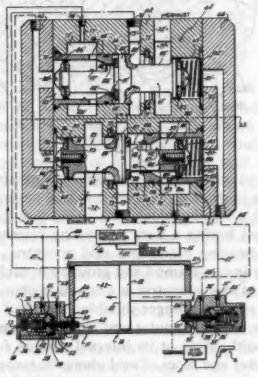
CONTROL SYSTEM FOR DOUBLE ACTING AIR MOTOR

Simon Z. Tammy, Lorain, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed June 13, 1974, Ser. No. 478,977

Int. Cl.² F01L *25/06, 15/16*

U.S. Cl. 91—306 **4 Claims**



1. Apparatus for controlling the transmission of fluid pressure to a double-acting fluid motor cylinder for driving a reciprocating piston therein, comprising directional control valve means, fluid pressure supply means, first and second pilot operating valves for transmitting fluid pressure from said pressure supply means alternately to opposite ends of said directional control valve means, said directional control valve means being operable to alternately supply fluid pressure to one end of said motor cylinder while exhausting fluid from the opposite end of said motor cylinder, said directional control valve means comprising

a valve body having a pair of stepped bores therein, each of said stepped bores being intersected and in fluid communication with an exhaust channel, a pressure supply channel and a motor supply channel,

a valve spool slidably mounted within each of said stepped bores, said spools each having two poppet sealing elements thereon operable with respect to said motor supply channel to alternatively connect said motor supply channel to said exhaust channel and supply channel,

means including a pair of chokes operable to assist in axially positioning each of said spools in said stepped bores,

one of said pair of chokes being a continuously operable choke of moderate restriction between said spool and said stepped bore,

the other of said pair of chokes being an intermittently operable choke of high restriction between said spool and said stepped bore, and

a spring in each of said bores operable to bias said spools axially toward one end position in said stepped bores.

3,943,824

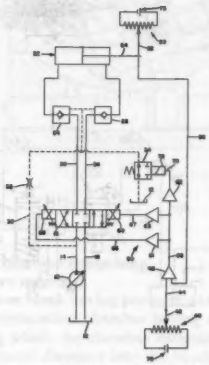
HYDRAULIC SYSTEM

Edward Horton Fletcher, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jan. 22, 1975, Ser. No. 542,893

Int. Cl.² F15B *9/03, 9/09*

U.S. Cl. 91—363 A **24 Claims**



1. A hydraulic system comprising: a fluid reservoir; a source of pressurized fluid; fluid function means providing an output and having at least one port; fluid passage means connected to the port; function control means operatively associated with the source for controlling the pressurized fluid in the fluid passage means; pilot operated check valve means disposed in the fluid passage means normally preventing flow of fluid away from the function means and including pressure responsive means to open the check valve means and permit the flow of fluid away from the function means when supplied with pressurized fluid; pilot passage means connected to the pressure responsive means; pressure control means exclusive of the function control means for the pilot passage means for selectively pressurizing and exhausting the pilot passage means; manually operable means providing an input proportional to desired function means output; and control means operatively associated with the function control means and the pressure control means responsive to the manually operable means input to connect the fluid passage means to the source and to pressurize the pilot passage means in response to the presence of the input.

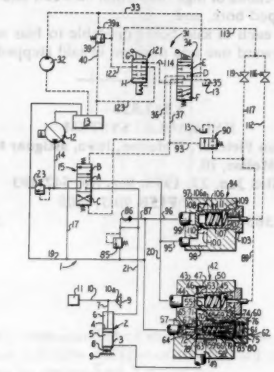
3,943,825
HYDRAULIC CONTROL SYSTEM FOR LOAD SUPPORTING HYDRAULIC MOTORS

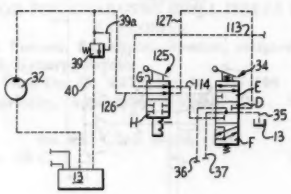
Donald L. Bianchetta, Coal City; Kenneth R. Lohbauer, Joliet, and Sammy J. Rhodes, Aurora, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 244,822, April 17, 1972, Pat. No. 3,805,678. This application Oct. 26, 1973, Ser. No. 409,869

Int. Cl.² F15B *11/08, 13/042*

U.S. Cl. 91—438 **6 Claims**





1. A fluid control system comprising:

a source of pressurized fluid including a reservoir;

a load supporting fluid motor having a load supporting chamber and an opposed chamber defined by a piston received in a cylinder;

a pilot actuated main control valve responsive to a predetermined minimum pilot pressure to control cummunication between said main source of fluid pressure and said load supporting chamber of said fluid motor for alternately establishing communication of said main source with said load supporting chamber and communication of said load supporting chamber with said reservoir;

a pilot control system including a source of pilot fluid and means including a pilot control valve connected to operate said main control valve;

a relief valve for establishing a predetermined pilot fluid pressure in said pilot control system and including pressure responsive means responsive to said predetermined fluid pressure to open said relief valve and bypass fluid from said pilot control system to said reservoir;

a safety valve disposed in fluid flow controlling relation between said source of pilot fluid and said pilot control valve and having an operative position to permit operation of said pilot system with said predetermined minimum pilot pressure and a safety position to render said pilot control system inoperative;

a load check valve having a control chamber and disposed between said load supporting chamber of said fluid motor and said main control valve so as to permit free flow of fluid from said control valve toward said load supporting end and to normally block fluid flow from said load supporting end toward said control valve;

means responsive to said pilot control system for opening said load check valve in response to pilot actuation of said main control valve to allow fluid flow from said load supporting chamber toward said control valve and said reservoir; and,

bypass vent means manually positionable for venting said control chamber via said pilot control valve and permit said load check valve to open in response to fluid pressure in said load supporting chamber in the absence of pilot pressure for actuation of said main control valve.

3,943,826
HYDRAULIC MOTORS AND PUMPS

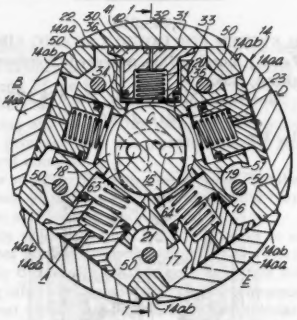
Yasuo Kita, Kyoto, Japan, assignor to Shimadzu Seisakusho, Ltd., Kyoto, Japan

Continuation of Ser. No. 420,944, Dec. 30, 1973, which is a continuation of Ser. No. 212,291, Dec. 27, 1971, abandoned. This application May 23, 1975, Ser. No. 580,212

Claims priority, application Japan, Dec. 30, 1970, 45-127708

Int. Cl.² F01B *1/06*

U.S. Cl. 91—488 **7 Claims**



1. In a hydraulic motor or pump comprising a casing, a shaft, means journalling said shaft in said casing, an eccentric on said shaft, a bearing block within said casing and about said eccentric and having a bore permitting relative rotation between said bearing block and said eccentric, a plurality of hydraulic cylinders formed and grouped in said bearing block radially about said eccentric in a common plane normal to the axis of said shaft, a plunger slidable in each of said cylinders, said plunger having an outer end face, flat faces of abutments formed in said casing at its internal surface for engagement with said outer end faces of said plungers, respectively, means urging said plunger in the direction of said face of abutment of said casing during the operation of said motor or pump, and said bearing block having a port communicating between its bore and the interior of each of said cylinders, pressure liquid being admitted to the cylinders in turn one after another during the operation of said motor or pump, the improvement comprising a centrally disposed recess formed in said outer end surface of each said plunger in alignment with the axis of said plunger, a port formed in said plunger communicating said recess with said cylinder interior, said centrally disposed recess having an area almost equal to that of the pressure bearing surface of said plunger, a shoulder on each of said plungers to engage the cylinder wall at a limited length, restraining means formed between said casing and said bearing block for limiting the range within which said bearing block is allowed to rotate with respect to said casing, said restraining means including a number of laterally extending pins affixed

to said casing and a number of generally semicircular cooperating recesses formed in the peripheral surface of said bearing block, said number of said pins and recesses being equal to the number of said hydraulic cylinders, said pins being engageable by said recesses such that during operation no more than two pins are in physical contact with their corresponding recesses, and said bearing block being carried about said eccentric such that the radially directed hydraulic forces exerted by the liquid acting on said block are always balanced with the liquid pressures within said cylinders during the operation of said motor or pump.

3,943,827

PUMPS FOR MOTOR FLUID MECHANISMS

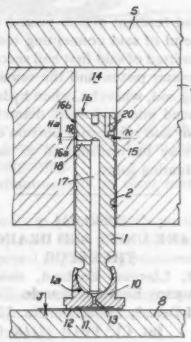
Jean E. Becquet, Seine-et-Oise, France, assignor to Poclain, Le Plessis-Bellevillie, France

Filed June 4, 1974, Ser. No. 476,264

Claims priority, application France, June 20, 1973, 73.22524

Int. Cl.² F01B *1/00*

U.S. Cl. 91—488 **3 Claims**



1. A motor or pump fluid-mechanism including a piston having a cylindrical sidewall, a cylinder in which said piston is slidably mounted for axial movement, one end face of said piston defining one end of a chamber in said cylinder into which chamber fluid is admitted and delivered successively during operation of said mechanism, a reaction plate, a hydrostatic shoe bearing on said reaction plate, said hydrostatic shoe engaging the end of said piston opposite said one end face and having a bearing face adjacent and facing said reaction plate, a cavity in said bearing face facingly adjacent said reaction plate, a first recess in said cylindrical sidewall portion of said piston adjacent the end of the piston remote from the end of the piston engaging said reaction plate, a duct connecting said cavity to said first recess for providing fluid communication therebetween, a second recess in the cylindrical wall portion of the piston located between and spaced from said first recess and said first end face of said piston, a collar portion of said piston separating said first recess from said second recess with said collar not contacting said cylinder, a constriction constituted by the clearance space lying between the outer periphery of said collar portion of the piston and the cylinder providing restricted flow communication between said second recess and said first recess and a secondary duct bored in the piston between said chamber and said second recess for providing fluid communication between said chamber and said second recess whereby hydraulic pressure in said chamber is communicated to said secondary duct to said second recess then through said constriction to said first recess then to said cavity through said duct connecting said first recess and said cavity thereby providing constant flow characteristics between said chamber and said cavity which does not vary as the piston cylindrical sidewall wears because the collar portion of the piston does not contact the cylinder wall and therefore provides an essentially constant flow of construction which is self-cleaning.

3,943,828

ROTARY MACHINES

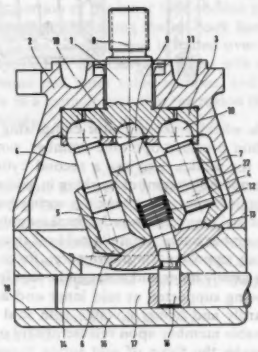
Ludwig Wagenseil, Vohringen, Germany, assignor to Hydromatic GmbH, Ulm (Danube), Germany

Filed Nov. 7, 1974, Ser. No. 521,761

Claims priority, application Germany, Nov. 26, 1973, 2358870

Int. Cl.² F01B *13/04*

U.S. Cl. 91—499 **7 Claims**



1. A rotary machine comprising:

a rotary drive member;

a rotary piston block having portions which define an open piston-reciprocation chamber having a central chamber axis along which the chamber extends with the uniform cross-sectional diameter into the block;

bearing means mounting the rotary drive member for rotation about a first axis, fixed relative to the bearing means;

mounting means mounting the rotary piston block for rotation about a second axis which is oblique to the said first axis and is spaced from the said central chamber axis;

and a piston member having an end portion articulated to the said rotary drive member at a location spaced from the said first axis and having a main portion received in the said piston-reciprocation chamber for reciprocation therein, the said main portion comprising:

a first piston length of part-spherical shape for sliding exclusively sealingly in the said piston-reciprocation chamber, so as to form an articulatedly movable sealing location, said part-spherical shape having a cross-sectional plane at which it has a maximum cross-sectional diameter corresponding to the said uniform cross-sectional diameter, the said first piston length decreasing in cross-sectional diameter with increasing distance in opposite directions from the said cross-sectional plane,

and a second piston length of frusto-conical shape being located to one end of the said first piston length and having a cross-sectional diameter decreasing with increasing distance from the said first piston length, for engaging with the said rotary piston block in the said piston-reciprocation chamber to transmit rotary drive between the said drive member and the block.

3,943,829

VEHICLE WHEEL BRAKE ACTUATORS

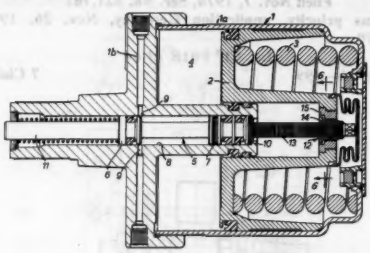
Charles Newstead, and Andrew Charles Walden Wright, both of Tyseley, England, assignors to Girling Limited, Birmingham, England

Filed Dec. 19, 1973, Ser. No. 426,079

Claims priority, application United Kingdom, Dec. 19, 1972, 58647/72; Jan. 5, 1973, 853/73

Int. Cl.² F01B 9/00

U.S. Cl. 92—29 **12 Claims**



1. A vehicle wheel brake actuator comprising a first cylinder, a first fluid pressure operable member working in said first cylinder for service braking, a second cylinder, second fluid pressure operable member working in said second cylinder for parking or emergency braking, spring biassing means urging said second member towards a brake-applying position, said second member being normally held-off in an inoperative position by an opposing fluid pressure, force transferring means having axially inner and outer ends, said force-transferring means being supported at said inner end and extending axially outwardly and being movable with said second fluid pressure operable member upon release of said opposing fluid pressure whereby the force of said spring biassing means is transferred through said second member and said force transferring means to said first member, said force transferring means extending freely and with clearance through said second member and being disengaged from said second member when in its inoperative position and being engageable therewith upon release of said opposing fluid pressure, and manually operable quick release means movable to disengage said force transferring means from said second member in its brake-applying position, whereby to permit axial movement of said force transferring means relative to said second member to release said brake the clearance between and disengagement of said force transferring means and said second member in its inoperative position being such that there is unobstructed spacing between said second member and all of the force transferring means so as to prevent said force transferring means from being corroded in said second member due to non-use.

3,943,830

ACTUATING FORCE GENERATING DEVICE

Susumu Sugiura, Yokohama, Japan, assignor to Tokico Ltd., Kawasaki, Japan

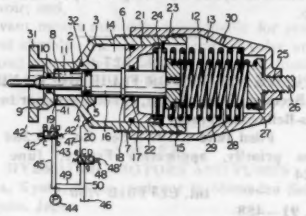
Filed Oct. 15, 1973, Ser. No. 406,612

Claims priority, application Japan, Oct. 21, 1972, 47-105541; Oct. 23, 1972, 47-105944; Apr. 20, 1973, 48-44877; Apr. 20, 1973, 48-44878

Int. Cl.² F01B 7/10

U.S. Cl. 92—63 **4 Claims**

1. An actuating force generating device comprising a two stage cylinder body consisting of small and large diameter cylinders arranged coaxially, small and large diameter pistons respectively slidably positioned in said cylinders, the forward end of each of said cylinders having a fluid port therein, a piston rod affixed to the end of said small diameter piston remote from said large diameter piston and having a forward actuating end projecting outwardly from the small diameter cylinder, a container disposed adjacent to the large diameter cylinder at the end of said cylinder body, remote from said small diameter cylinder, a connecting rod extending slidably through the large diameter piston in sealing relation therewith and connected to said small diameter piston, means on said connecting rod transmitting actuating force from the large diameter piston to the connecting rod, first resilient means disposed in said container coupled only to said large diameter



piston, and second resilient means in said container coupled only to the rear end of said connecting rod, a portion of the force being transmitted of said first and second resilient means to said large diameter piston and the remainder of the force to said connecting rod, whereby, when hydraulic liquid which has been introduced into said small diameter cylinder is discharged therefrom said remainder portion of the force of said resilient means may be transmitted to said piston rod for generating an actuating force.

3,943,831

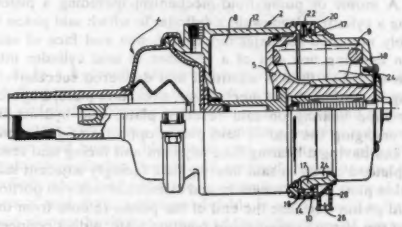
SPRING BRAKE UNITS AND DRAINAGE MEANS THEREFOR

Ralph Coupland, Lincoln, England, assignor to Clayton Dewandre Company Limited, Lincoln, England

Filed Dec. 5, 1974, Ser. No. 529,959

Int. Cl.² F01B 31/18

U.S. Cl. 92—86 **6 Claims**



1. A spring brake unit for a vehicle braking system comprising a housing member having a detachable end wall member providing an annular joint between said members, a piston axially movable within the housing member and defining a spring chamber between the piston and end wall and a fluid pressure chamber on the opposite side, means on the piston extending through said fluid pressure chamber for connecting said piston to the vehicle brakes, spring means in said spring chamber axially extending between said piston and said end wall, said spring means being compressed and held in energized condition by said piston when there is a predetermined pressure in said fluid pressure chamber and being adapted to expand and displace said piston in the brake applying direction when there is less than said predetermined pressure in said fluid pressure chamber, means providing a gaiter circuferentially surrounding and bridging said joint, means defining at least one moisture drainage port in at least one of said mem-

bers opening into the gaiter at said joint, and a normally closed drain outlet in said gaiter.

3,943,832

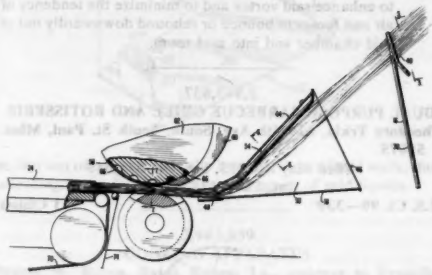
METHOD AND APPARATUS FOR THE HANDLING OF TOW IN THE MANUFACTURE OF TOBACCO SMOKE FILTERS CONTAINING PARTICULATE MATERIAL

John H. Sexstone, Middletown, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Mar. 13, 1974, Ser. No. 450,574

Int. Cl.² A24C *5/50*

U.S. Cl. 93—1 C **17 Claims**



1. A method for handling a tow of web material in the manufacturing of tobacco smoke filters having particulate material therein comprising:

a. feeding a continuous web of filter material having opposed edges;

b. shaping the web to provide web portions in first and second planes, said first plane overlying said second plane, said opposed edges being positioned in said second plane; and

c. forming the shaped web into a channel with the opposed edges at the base on the opposite side from the trough of said channel thereof.

3,943,833

PRODUCTION OF LINED VALVED BAGS

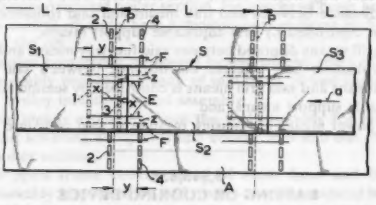
Friedrich Franz Brockmüller, Lengerich of Westphalia, Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany

Division of Ser. No. 301,760, Oct. 30, 1972, abandoned. This application Sept. 17, 1974, Ser. No. 506,758

Claims priority, application Germany, Nov. 6, 1971, 2155265

Int. Cl.² B31B *39/00*

U.S. Cl. 93—35 R **2 Claims**



1. A method of making a bag of the type comprising a single or multiply outer tube section of paper and a plastics inner tube section having at at least one end of said inner tube section a folded cross-bottom closure which is incorporated in a folded cross-bottom closure at the corresponding end of said outer tube section and in which the folded closure at only one end of the inner tube section is incorporated in the folded closure of the outer tube section, comprising the steps of synchronously applying a succession of overlapping flattened plastics inner tube sections to a paper web, which has transverse perforations at intervals equal to the intended length of the outer tube sections, in an arrangement such that the transverse perforations extend closely adjacent the overlapping portions of the inner tube sections, folding the web around the inner tube sections to form flattened outer tube sections, and severing from the web along the transverse perforations successive flattened bag sections each comprising one outer tube section and one inner tube section that projects from the outer tube section with one end, the ends of the inner tube sections that project beyond the transverse perforations are connected at both faces to the outer tube section by adhesive applied to the latter along two lines, one line of adhesive being closely adjacent the perforations and the other being set back from the perforations at a spacing substantially equal to the mutual overlap of the side flaps of the closure of the outer tube section, and wherein, during opening of the outer tube section for the purpose of forming the folded closure, a tongue defined on the projecting portion of the inner tube section by incisions is turned over through 180° along the set-back line of adhesive in the region of the side flap that is folded over first, further adhesive is applied to the margins of the still open closure folds of the inner and outer tuber sections, and the closures are then made in a manner such that the region containing the turned-over tongue is folded over last of all.

3,943,834

APPARATUS FOR FOLDING AND FLAT-SEALING THE BOTTOM OF A LIQUID-PROOF PACKAGE

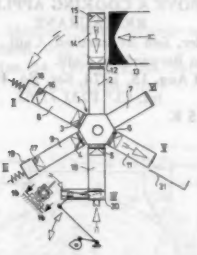
Wilhelm Vetten, Dusseldorf, Germany, assignor to Jagenberg Werke Aktiengesellschaft, Dusseldorf, Germany

Filed July 12, 1974, Ser. No. 488,602

Claims priority, application Germany, July 24, 1973, 2337449

Int. Cl.² B31B *1/32*

U.S. Cl. 93—44.1 GT **6 Claims**



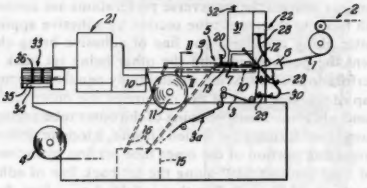
1. An apparatus for the folding and flat sealing of the bottom of a liquid-proof package with a roof-shaped folded closure and inwardly folded gable walls starting with tubular package blanks, comprising a plurality of mandrels for carrying said blanks, means for advancing said mandrels progressively through a plurality of stations to be operated upon, means for effecting gable folding on said blanks, and means for effecting roof folding on each blank after a gable folding operation, said gable folding means and said roof folding means being positioned to operate on a blank in the course of the passage of said blank on a mandrel between two successive stations and each of said gable folding means and said roof folding means including blank contracting means and cam means controlling each of said blank contacting means, each cam means being shaped so that its respective blank contacting means after initially contacting a blank moves with said blank between said two successive stations and remains in contact therewith at the initially contacted location until said blank contacting means has completed its operation on said blank.

3,943,835

PRODUCTION OF TOBACCO SMOKE FILTER ROD

John A. Luke, Woodlands, and Raymond J. Harrison, Southampton, both of England, assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed June 20, 1974, Ser. No. 481,094
Claims priority, application United Kingdom, July 9, 1973, 32546/73
Int. Cl.² A24C 5/50
U.S. Cl. 93—77 FT 6 Claims



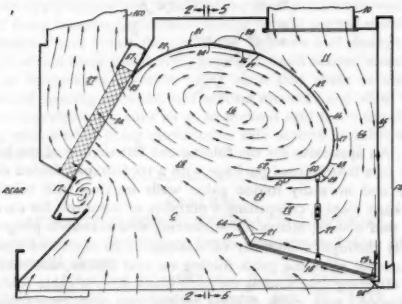
1. A method of wrapping a continuous filter rod and producing tobacco-smoke filter sections, comprising feeding without heating a wrapping strip of a heat-shrinkable thermoplastics film material past an applicator for applying adhesive to the edges of the strip and, together with a filtering medium, to garniture means for wrapping the said strip around the said medium, which means includes a sealing station comprising a cooled long folder provided with a semicylindrical groove closely matching the rod size and of a length sufficient to permit setting of the adhesive to form a seam between the said edges, and feeding the wrapped rod thus produced to a cut-off device with guiding means for the cut-off sections.

3,943,836

APPARATUS FOR REMOVING FUMES FROM THE SPACE ABOVE A COOKING APPLIANCE IN A RESTAURANT

Irvin R. Kuechler, San Bernardino, Calif., assignor to Vent-Cair, Inc., San Bernardino, Calif.

Filed Aug. 15, 1974, Ser. No. 497,690
Int. Cl.² F23J 11/02
U.S. Cl. 98—115 K 37 Claims



1. Apparatus for filtering fumes in the space above a cooking appliance in a room which comprises:

a. wall means to define a capture and entrainment chamber adapted to be disposed above a cooking appliance in a room and to receive grease-laden fumes from said cooking appliance,

b. grease filter means exposed to said chamber,

c. blower means to supply air at high velocity directly to said chamber and to draw air and fumes from the side of said filter means remote from said chamber,

said blower means being connected to effect said supply of air without depleting from said room more than a minor fraction of the air passed through said chamber,

d. means to direct air from said blower means through said chamber in a high-velocity curtain flowing toward said filter means,

whereby grease-laden fumes from said cooking appliance are entrained in said curtain and directed toward said filter means, and

e. means to cause a large portion of the air and fumes from said curtain to flow in a large-diameter high-velocity vortex located above said curtain,

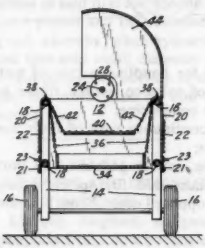
said last-named means comprising a curved wall shaped to enhance said vortex and to minimize the tendency of air and fumes to bounce or rebound downwardly out of said chamber and into said room.

3,943,837

DUAL PURPOSE BARBECUE GRILL AND ROTISSERIE

Theodore Trkla, 624 4th Ave. South, South St. Paul, Minn. 55075

Filed May 8, 1975, Ser. No. 575,619
Int. Cl.² A47J 37/04
U.S. Cl. 99—339 11 Claims



1. A dual purpose barbecue grill and rotisserie cooking device comprising:

a. two upright end frame members,

b. an elongated handle member detachably mounted to said end frame members in such a manner that said frame members face each other but are separated along said handle member,

c. side panels attached to said handle member between said end frame members, at least one of said side panels having means for permitting air flow therethrough,

d. an elongated rotisserie bar extending between said end frame members and rotatably mounted to each said end frame member,

e. fuel tray means below said rotisserie bar, wherein the distance between said tray means and said rotisserie bar is controlled by first adjustable support means,

f. grill means disposed between said fuel tray means and said rotisserie bar, wherein the distance between said tray means and said grill means is controlled by second adjustable support means, and

g. power means for causing rotation of said rotisserie bar.

3,943,838

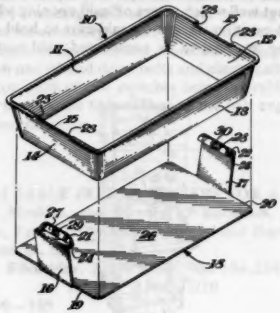
BASTING OR COOKING DEVICE

Harry D. Price, 5 Center Circle, Wilmington, Del. 19808

Filed Aug. 7, 1974, Ser. No. 495,532
Int. Cl.² A47J 36/18
U.S. Cl. 99—345 10 Claims

1. A device for placement on the bottom of a cooking utensil and for holding solid materials while affording passage of liquids therethrough comprising an element having four walls and being open at the top and the bottom; and a plate attachable in operative position with said element resting said

bottom of close to said utensil and spanning said opening at said bottom of said element and becomes closely positioned



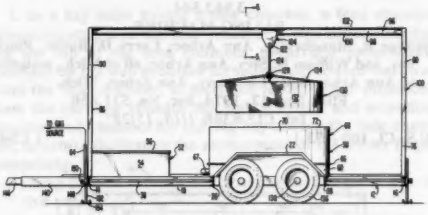
to, but out of contact with, the bottom edges of said walls, thus affording a gap for the ingress and egress of said liquids.

3,943,839

COOKING APPARATUS

Wilvin W. Racca, Baton Rouge, La., assignor to Franklin Press, Inc., Baton Rouge, La., a part interest

Filed May 29, 1974, Ser. No. 474,224
Int. Cl.² A47J *27/21, 33/00*
U.S. Cl. 99—407 **1 Claim**



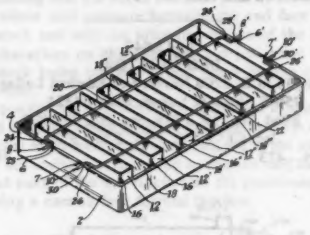
1. A mobile cooker comprising:
a supporting frame having a substantially horizontal base;
a burner box mounted on said base and having a side wall and a top plate;
a boiler section comprising a vertical wall with an open top, the wall extending from the top plate of the burner box;
an overhead beam located on said frame, the overhead beam being supported at its ends by vertical posts on said frame, over said boiler section, the overhead beam having a central rib and a base extending outwardly on each side of the rib;
a trolley comprising a housing having spaced apart casters movably engaged on each of said bases of said beam;
the trolley including a reel assembly;
cable means extending from the reel assembly for raising and lowering an open frame cooker into and out of the boiler section;
said open frame cooker being of mesh form and being movably suspended by said trolley on said overhead beam and being adapted for vertical alignment with the boiler section and for movement into and out of said section;
the frame being provided with ground wheels;
leveling means on said frame, adjustable for terrain contour and movable to upward storage positions for transit;
the leveling means including a series of tubular sleeves secured in vertical positions on the frame; and
means for heating the burner box, said means comprising a series of burners in the boiler section.

3,943,840

POCKET BUN BAKING DEVICE

Brown Bolte, 1184 Lake House Court, N. Palm Beach, Fla. 33408

Filed June 13, 1974, Ser. No. 476,341
Int. Cl.² A21B *3/13*
U.S. Cl. 99—428 **3 Claims**



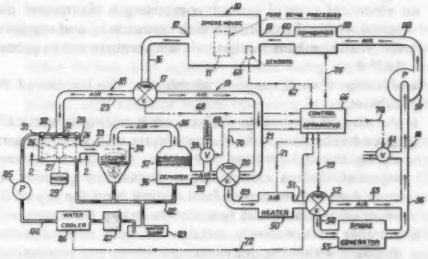
1. A pocket bun device comprising:
a pan, having a fixed bottom and sides with an open top,
a die holding means removably mounted to opposite sides of said pan for vertical movement out of said pan,
a plurality of generally open rectangular box-shaped pocket bun dies projected downwardly from and rigidly connected to said die holding means, said dies having a bottom member positioned generally parallel to said bottom of said pan in a mounted position and during removal, and
a plurality of bun divider means projecting downwardly from and connected to said die holding means, and divider means are positioned between all said pocket bun dies.

3,943,841

CONDITIONING THE AIR OF A SMOKEHOUSE OR THE LIKE

Min-Nang Huang, Madison, Wis., assignor to DEC International, Inc., Madison, Wis.

Filed Mar. 24, 1975, Ser. No. 561,232
Int. Cl.² A23B *4/04*
U.S. Cl. 99—470 **22 Claims**



1. In an apparatus for conditioning the air in a food processing chamber means, such as a smokehouse, which apparatus includes air conduit means communicating with the smokehouse at an exhaust connection and an intake connection and through which the air to be conditioned is withdrawn from the chamber means at the exhaust connection and through which the air after conditioning is returned to the chamber means at the intake connection, said conduit means including a device which reduces the temperature of withdrawn air, at least one of said means including an air heating device for maintaining the air temperature in said chamber means at food processing temperature, the improvement comprising:
at least part of said conduit means between said connections including two branches and modulating valve means for

establishing the proportions of the total amount of withdrawn and returned air which passes through each of said branches;

said air temperature reducing device being in one of said branches;

whereby the amount of the air subjected to temperature reduction may be varied without varying the total amount of withdrawn and returned air.

3,943,842

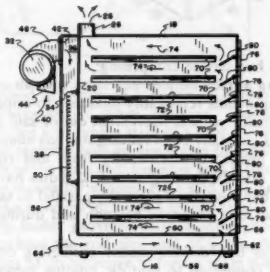
DEHYDRATOR

Jay P. Bills, 1136 E. 2200 North, and Edward LeRoy France, 1975 N. 950 E., both of Logan, Utah 84321

Filed Aug. 19, 1974, Ser. No. 498,809

Int. Cl.² A23L *3/16;* **F26B** *9/06*

U.S. Cl. 99—473 **10 Claims**



1. A dehydrator for home utilization comprising:

a cabinet having a food access door and defining influent air passageway means, air distribution means, a dehydrating enclosure and effluent air pathway means;

blower means for continuously displacing air from the surrounding atmosphere seriatim through the passageway means, the air distribution means, the dehydrating enclosure and the pathway means;

heating means disposed within the passageway means for elevating the temperature of influent air being displaced therethrough;

an electrical control system comprising a thermostat disposed within the cabinet which connects to and regulates the heating means to cause air temperature not to exceed 145° F.;

a plurality of shelf supports attached to the interior of the cabinet;

a plurality of removable shelves, each resting in vertically spaced relation one to the next upon said shelf supports within the dehydrating enclosure, the space between adjacent shelves comprising a horizontal corridor for heated air to pass across food resting upon the top of the lower of said adjacent two shelves to dry the same; and

a plurality of selectively settable air flow control means disposed within the dehydrating enclosure to respectively determine the amount of air from the air distribution means permitted to reach each horizontal corridor.

3,943,843

WASTE COMPACTOR

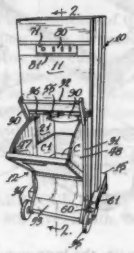
Richard W. Steinberg; Samuel B. McClocklin, and Clarence L. Kostelecky, all of Owatonna, Minn., assignors to Owatonna Tool Company, Owatonna, Minn.

Division of Ser. No. 359,198, May 9, 1973, Pat. No. 3,869,978. This application Apr. 25, 1974, Ser. No. 463,993

Int. Cl.² B30B *15/16*

U.S. Cl. 100—51 **2 Claims**

1. A compactor including a casing with a front wall having an opening to receive a cart, means to removably lock said cart to said casing, including a pair of hooks at the lower end of the casing, a pair of pins on the cart engageable in said hooks, and latch means carried on the casing to engage said cart and hold said hooks and pins in engagement, said cart having a front wall which closes off said opening when the cart is in locked position, means on said cart to hold a container for receiving material to be compacted, said cart front wall



being defined at least in part by a loading chute mounted for pivotal movement relative to the remainder of the cart, and compacting means within the casing including a disc, means including a fluid motor for lowering said disc against material in the container to exert forces acting downwardly and inwardly on said material, and means for maintaining the force at a maximum value for a number of seconds to impart some "set" to the material.

3,943,844

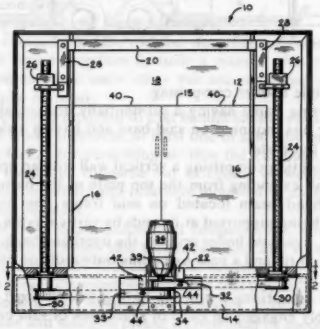
BALING MACHINE

Wilbur R. Standbridge, Ann Arbor; Larry D. Butler, Pinckney, and William H. Sivy, Ann Arbor, all of Mich., assignors to Ann Arbor Baler Company, Ann Arbor, Mich.

Filed Dec. 12, 1974, Ser. No. 531,850

Int. Cl.² B30B *1/18, 15/28*

U.S. Cl. 100—53 **1 Claim**



1. Compactor apparatus comprising a container having a a floor, front and rear walls, and a pair of side walls, a platen movable downwardly in said container toward said floor, means for moving said platen downwardly comprising a pair of upright screws located adjacent said side walls and at opposite ends of said platen, nuts threadably mounted on said screws, means securing said platen to said nuts, means for rotating said screws to thereby move said nuts and thus said platen toward and away from said floor, said means for rotating said screws comprising a motor disposed rearwardly of and adjacent said rear wall and having a drive shaft, said motor being positioned so that said drive shaft is at substantially equal distances from said upright screws, a pair of pulleys on the lower ends of said screws, a pair of pulleys mounted on

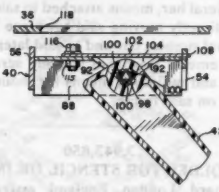
said drive shaft, a pair of drive belts, each of said drive belts extending around one of said motor drive shaft pulleys and one of said screw pulleys, so that the rotation of said motor pulleys by said motor provides for rotation of said screw pulleys, thereby rotating said screws and moving said platen upwardly or downwardly, a pair of switches having actuator members, each of said actuator members being positioned in contact with one of said drive belts and electrically connected to said motor, each of said switches being operable to shut off said motor in response to breakage of the belt engaged by the actuator therefor.

3,943,845

REPLACEABLE FEEDER FINGERS FOR A BALER

Charles D. Mecklin, and Edward L. Robinson, Jr., both of Memphis, Tenn., assignors to International Harvester Company, Chicago, Ill.

Filed Mar. 7, 1975, Ser. No. 556,234
Int. Cl.² B30B *15/30*
U.S. Cl. 100—189 **5 Claims**



1. In a hay baler having a bale chamber, a feed chamber communicating with the bale chamber, a wall structure defining the top of the feed chamber, a carriage reciprocably mounted on the wall structure for movement toward and away from the bale chamber, at least one feeder finger suspended from the carriage beneath the wall structure and extending into the feed chamber for moving hay toward the bale chamber, structure facilitating the replacement of the feeder finger comprising:

a clamp on said carriage for retaining said finger in operative position;

means for disconnecting said clamp from said carriage;

and an opening defined through said wall structure above said clamp and finger of a size permitting said clamp and finger to be moved upwardly therethrough, said finger including a pivot shaft projecting therethrough, said carriage including an upwardly facing seat for receiving said shaft, said clamp including a downwardly facing seat engageable with said shaft to releasably retain it between said seats.

3,943,846

METHOD AND APPARATUS FOR IMPRESSING IDENTIFYING CHARACTERS INTO METAL BAR STOCK

Bernard H. Geisow, and Lamont Harrelson, both of Houston, Tex., assignors to Daniel Industries, Inc., Houston, Tex.

Division of Ser. No. 325,145, Jan. 19, 1973, Pat. No. 3,882,772. This application Oct. 17, 1974, Ser. No. 515,614
Int. Cl.² B44B *5/00*; B26D *3/16*
U.S. Cl. 101—4 **5 Claims**

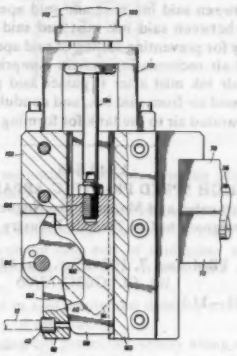
1. In combination with a bolt cutting machine, apparatus for impressing identifying characters on the end face of advancing bolt blank bar stock as the bar stock is supplied to a cutting machine, comprising

a die with selected identification characters thereon, positioning and locking means for positioning and locking said die in the axial path of travel of the advancing bar stock to allow the end face of said advancing bar stock to engage said locked die and exert continued pressure against the die, said pressure exerted by the bar stock being sufficient to impress said die characters into the end face, and

switch means connected to the cutting machine for generating a signal just prior to the time the cutting machine cuts the bar stock into a bolt blank,

said positioning and locking means receiving said signal and in response thereto unlocking said die and repositioning said die out of the axial path of the bar stock to relieve said pressure between the end face of the bar stock and said die after impression of the identifying characters on the end face but just prior to the bar stock being cut into a bolt blank by the cutting machine,

a die positioning member being connected to said machine, said die positioning member carrying said die and having pivotal movement to position said die in the axial path of the advancing bar stock and to remove said die from the axial path of the bar stock, said die positioning member having a cam surface formed thereon,



a reciprocating drive means being connected to said die positioning member and having a drive shaft attached thereto, said reciprocating drive means imparting linear movement to said drive shaft,

actuator means being connected to said reciprocating drive means and controlling energization of said reciprocating drive means, said actuator means being electrically responsive and being electrically connected to said switch means, said actuator means operating in response to said electrical signals from said switch means, and

a cam member attached to said drive shaft and engaging said cam surface of said die positioning member for positioning and locking said member and said die into the axial path of the advancing bar stock upon the downstroke of said reciprocating drive means and unlocking said retracting said member to position said die out of the axial path of the bar stock upon the upstroke of said reciprocating drive means.

3,943,847

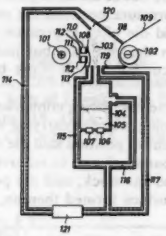
HIGH SPEED PRINTING APPARATUS

Akinori Watanabe, and Katsuhide Tanoshima, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 7, 1974, Ser. No. 495,378
Int. Cl.² G03G *13/06*
U.S. Cl. 101—114 **9 Claims**

1. An air recirculating system for a high speed printing apparatus in which ionized particles are mixed with an air-ink mist to cause printing on a platen, said air-ink mist being formed by vibrating a tank containing said ink, said printing

apparatus comprising an anode, a cathode, with said mist being passed therebetween, recording paper for receiving ink to be deposited thereon, an aperture plate and control electrode located between said anode and said ink mist to control the deposition of ink on said recording paper, wherein the improvement comprises passage means for forming air



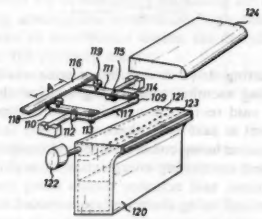
streams between said ink mist and said aperture and control plates and between said ink mist and said recording paper, respectively for preventing soiling of said aperture and control plates, said air recirculating system comprising means to recover the air ink mist after it passes said platen, means for separating said air from said ink, and conduit means for carrying said separated air to the tank for forming said air-ink mist.

3,943,848

HIGH SPEED PRINTING APPARATUS

Akinori Watanabe, and Matsusaburo Noguchi, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 7, 1974, Ser. No. 495,308
Int. Cl.² G03G *13/06*
U.S. Cl. 101—114 **6 Claims**



1. For a high speed printing apparatus which performs its printing operation by charging ink droplets of an ink mist when said mist passes a pair of electrodes such that said droplets adhere to ions, said ink particles ionically charged being selectively adsorbed on a recording paper to form printed symbols, curtain means for blocking said ionically charged ink droplets from the portion of said recording paper where printing does not occur, said curtain means comprising an air stream, said air stream forming a barrier in front of said portion of said recording paper where printing does not occur.

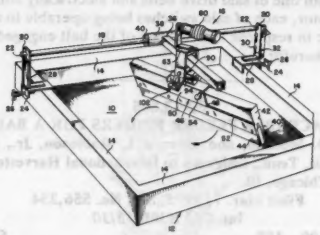
3,943,849

SQUEEGEE WITH SWEEP-MOVEMENT CAPABILITY

Michael Vasilantone, 147 E. First Ave., Roselle, N.J. 07203

Filed Sept. 13, 1973, Ser. No. 396,778
Int. Cl.² B41F *15/02, 15/42*
U.S. Cl. 101—123 **9 Claims**

1. A squeegee apparatus for use with a printing screen and frame therefor comprising a longitudinal support mounted on said frame, a lateral support bar mounted for movement longitudinally of said longitudinal support bar and extending transversely to said longitudinal support bar and over said screen, a squeegee blade assembly, comprising a squeegee blade having a longitudinal axis and attaching means for attaching said squeegee blade to said lateral support bar for free movement along said lateral bar and for substantially free rotative movement about an axis extending vertically and perpendicularly to said lateral bar, means attached to said squeegee blade assembly for directly moving said squeegee blade relative to said longitudinal support bar and to said lateral support bar in sweeping movements over said printing screen to force ink therethrough, and mounting means for mounting said squeegee apparatus on said frame.

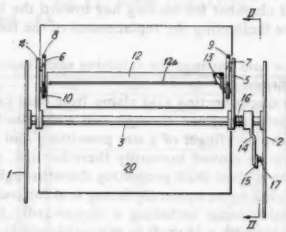


3,943,850

CORE HOLDER FOR STENCIL OR INK SCREEN

Michael Maynard, London, England, assignor to Gestetner Limited, London, England

Filed Sept. 14, 1973, Ser. No. 397,305
Claims priority, application United Kingdom, Sept. 15, 1972, 43012/72
Int. Cl.² B41F *15/38*
U.S. Cl. 101—127.1 **15 Claims**



1. A device for the use with a stencil duplicator having a rotary cylinder about which is wrapped a stencil or ink screen, said device serving the purpose of receiving the stencil or ink screen as it is removed from the rotary cylinder, comprising:

a. a frame;

b. a pair of core holding members freely rotatably mounted on said frame and axially aligned for releasably holding a core therebetween adjacent to and parallel with the rotary cylinder of a stencil duplicator;

c. lever means mounted adjacent at least one of said core holding members to be pivoted toward and away from the rotary cylinder of a stencil duplicator;

d. a drive wheel freely rotatably carried by said lever means and being drivingly connected with said one core holding member whereby rotation of said drive wheel produces rotation of said core holding member;

e. mounting means on said frame mounting said lever means for pivotal movement between a first position whereat the drive wheel carried by said lever means is in rolling contact with an adjacently located rotary cylinder of a

stencil duplicator and is driven thereby whereupon a stencil or ink screen carried on the rotary cylinder would be removed and taken up on a core releasably held by said core holding members after the stencil or ink screen has been started on the core and a second position whereat the drive wheel would be out of rolling contact with adjacently located rotary cylinder; and

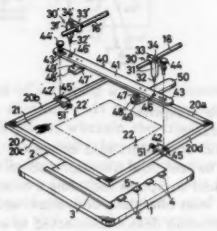
f. pivoting means for pivoting said lever means between said first and second positions.

3,943,851

FLAT SCREEN ALIGNMENT DEVICE

Kunio Inada, Kitamoto, and Morio Yamaguchi, Tokyo, both of Japan, assignors to Pilot Man-Nen-Kitsu Kabushiki Kaisha, Tokyo, Japan

Filed June 22, 1973, Ser. No. 372,756
Claims priority, application Japan, July 10, 1972, 47-68803
Int. Cl.[2] B41F *15/36*
U.S. Cl. 101—127.1 6 Claims



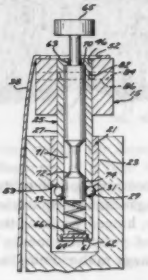
1. In a screen printing machine comprising a sheet print means including a printing table on which a sheet material to be printed is placed and set at a predetermined position, a printing machine frame above said printing table, a rectangular shaped screen fixing frame, having opposed frame sections, to be mounted to said printing machine frame, and a non-transparent screen attached to said fixing frame and having a pattern to be printed on said sheet material (2), the improvement of which comprising a screen setting apparatus comprising first reference points (5, 5', 5*a*, 5*b*) provided on said sheet print means, first reference members (30, 30') slidably mounted on said printing machine frame (10) to have a predetermined distance and direction (D) from said first reference points (5, 5'), second reference points (22, 22', 22*a*, 22*b*) provided on said screen (21), a pair of brackets (42, 42', 63, 63') slidably mounted on said opposite fixing frame sections (20*b*, 20*d*), a bar member (40, 60) removably mounted on said brackets at both end portions thereof, said bar member having first reference marks (49, 49', 49*a*, 49*b*) to be vertically lined up with said second reference points on said screen, and second reference means (64, 64', 46, 46') to be vertically lined up and physically engaged with said first reference members (30, 30') with the horizontal distance and direction (D') between said first reference marks and said second reference means being fixedly predetermined, wherein after sliding and adjusting said first reference members along the printing machine frame in such a manner that the horizontal distance and direction (D) from said first reference points on said sheet material are made equal to those between said first reference marks and second reference means on said bar member and when said first reference marks and second reference means on said bar member are vertically lined up and physically engaged with second reference points on said screen and said first reference members, respectively, said second reference points on said screen are registered with said first reference points on said sheet print means, thereby aligning said pattern with said sheet print means.

3,943,852

PRINTING SADDLE HAVING SELF-CONTAINED LATCH

David B. Czinger, Los Alamitos, Calif., assignor to Beach Manufacturing, Inc., Buena Park,, Calif.

Filed Oct. 23, 1974, Ser. No. 517,365
Int. Cl.[2] B41F *27/06*
U.S. Cl. 101—415.1 13 Claims



1. A saddle for mounting a flexible printing plate from a cylindrical drum comprising:

a longitudinally extending semicylindrical saddle shell formed on one longitudinal side with a plate mounting device for receiving one end of said plate and on its opposite longitudinal side with at least one outwardly opening cavity;

a sleeve mounted in said cavity and defining a stop surface facing inwardly of said cavity;

an elongated biasing bar projecting axially along said opposite side of said saddle and including printing plate fastening means for receiving the end of the said plate opposite said one end, said bar being shiftable from an extended to a retracted position and being formed with a bore confronting said cavity;

biasing means biasing said bar away from said saddle;

limit means limiting travel of said bar away from said saddle;

a self-contained latch formed at one extremity with a tubular housing received in said bore and terminating in an open end, said latch being further formed with a barrel projecting axially from said bore for free telescopical receipt in said sleeve and having at least one transversely extending passage means aligned behind said stop surface when said bar is in its retracted position, said housing still further including first abutment means adjacent said passage means and facing said open end;

latching element means disposed in said barrel for shifting transversely through said passage means to a latching position engaged behind said stop surface;

retaining means in said barrel for retaining said latching element from escape transversely outwardly from said passage means;

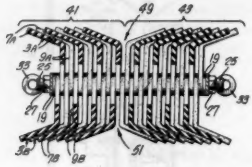
said latch further including a plunger received in said housing and operative upon axial shifting thereof in said sleeve to a first axial position to urge said latching element transversely outwardly in said passage means to said latching position and upon shifting of said plunger to a second axial position to release said latching element for retraction from said latching position to release said housing from said stop surface for axial sliding relative thereto; and

a spring contained in said latch to bias said plunger to said second position whereby upon assembly said entire self-contained latch may be inserted in said bore as a unit.

3,943,853
BLASTING MATS

Thomas Alexander Robertson, Sheldrake Lake RR. No. 3, and John Alfred King, Box 5-1-5, SS. 2, both of Armdale, Halifax County, Nova Scotia, Canada

Filed Mar. 4, 1974, Ser. No. 448,169
Int. Cl.² F42D 5/00
U.S. Cl. 102—22 11 Claims

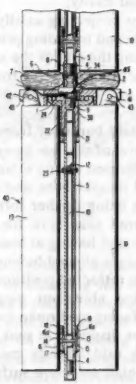


1. A blasting mat comprising a plurality of flexible, resilient members; rigid joining means along at least one side of the mat for use in detachably, hingedly joining the mat to at least one other similar mat; and protective means covering the joining means to prevent damage to the joining means during blasting.

3,943,854
EJECTION HEAD WITH ACTIVE ELEMENTS FOR ROCKETS

Kurt Zwicker, Porz-Eil, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Germany

Filed Apr. 12, 1974, Ser. No. 460,480
Claims priority, application Germany, Apr. 12, 1973, 2318307
Int. Cl.² F42B 4/10, 13/50
U.S. Cl. 102—34.4 29 Claims



1. Ejection head of projectiles, rockets and the like, comprising at least one ejection section including a carrier plate, a plurality of ejection tubes for containing active elements mounted annularly about the carrier plate, means for controlling the descent of the ejection section connected to the carrier plate, the ejection tubes being movable from a folded position to a spread-apart position, means for locking the ejection tubes in the folded position, means for spreading the ejection tubes apart, and pyrotecnical element means for generating compressed gas for triggering the locking means to unlock the ejection tubes and for causing the spreading means to spread the ejection tubes apart.

3,943,855
COMPUTER FOR MISSILE

Kenneth E. Woodward, McLean, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

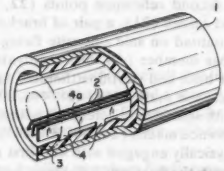
Filed May 25, 1964, Ser. No. 370,403
Int. Cl.² F42C 5/00
U.S. Cl. 102—70 R 5 Claims

1. A fluid fuze comprising:
a. a fluid detector,
b. a pure fluid computer, said computer having an input connected to said fluid detector and an output,
c. said pure fluid computer including a bi-stable fluid amplifier and at least one pulse converter, and
d. a fluid utilization device connected to an output of said pure fluid computer.

3,943,856
HOT GAS GENERATORS, POWDER CHARGES THEREFOR, AND PROCESS OF PRODUCTION THEREOF

Jacques P. A. Ramont, Bourges; Andre C. Jean, Conflans-Ste. Honorine; Leon M. Puydebois, Paris; Claude R. Rousse, Rueil, and Michel Massay, Levallois-Perret, all of France, assignors to Etat Francais, Paris Armees, France

Filed June 21, 1974, Ser. No. 481,843
Claims priority, application France, July 13, 1973, 73.25702
Int. Cl.² F42B 1/00
U.S. Cl. 102—103 10 Claims

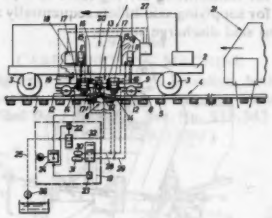


1. In a hot gas generator having a combustion chamber wall, a lamellar powder charge disposed along at least a portion of said wall, said powder charge including a unitary lamellar powder charge comprising a plurality of powder lamellae disposed side by side at regularly spaced intervals and fixed to a common shoe so as to project therefrom and define spaces between adjacent lamellae, each lamella being fixed to said shoe by spaced anchoring teeth formed in a marginal edge portion and embedded only partially in said shoe, such that the spaces between adjacent teeth on the same lamella form apertures communicating the spaces on each side of the lamella.

3,943,857
TRACK SURFACING

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen Industriegesellschaft MBH, Vienna, Austria

Filed July 18, 1974, Ser. No. 489,938
Claims priority, application Austria, Sept. 2, 1973, 8174/73
Int. Cl.² E01B 27/16
U.S. Cl. 104—7 R 15 Claims

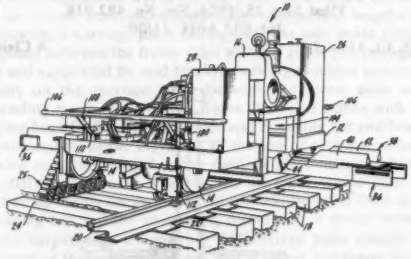


1. In a method of surfacing a track consisting of two rails fastened to ties, abutting ends of adjacent ones of the track rails forming rail joints, wherein the track has a controlled level, the steps of upwardly bending the abutting rail ends above the controlled track level while simultaneously exerting a downward thrust on the abutting rail ends, controlling the upward bending stroke to limit the same, and tamping ballast under the ties in the region of the upwardly bent rail joints to maintain them upwardly bent.

3,943,858
MACHINE FOR SETTING TIE PLATES AND THE LIKE

Andrew M. Dieringer, Waterford, and Frank F. Katcha, Milwaukee, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Filed Feb. 12, 1973, Ser. No. 331,818
Int. Cl.² E01B 29/24
U.S. Cl. 104—16 21 Claims

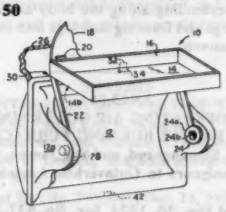


1. In a machine for setting tie plates on top of the ties for a railroad track, a wheeled frame adapted to be moved along the track, a laterally disposed conveyor on the frame for bringing plates into the frame from the shoulder of the right-of-way, and a plate handler on the frame for lowering the plates, one at a time, for a conveyor to the ties constructed and arranged so that the plates will contact the top of the ties with their lower surfaces generally parallel to the upper surface of the ties and with a minimum of free fall thereafter so that the tie plates will be accurately positioned on the ties.

3,943,859
SHELF ATTACHMENT

Philip Boone, 15 Fenwick Road, Winchester, Mass. 01890

Filed Nov. 25, 1974, Ser. No. 526,963
Int. Cl.² A47B 35/00
U.S. Cl. 108—50 10 Claims



1. A shelf-supporting device for attachment to a conventional toilet-tissue dispenser of a type having a pair of forwardly extending posts with bore portions formed therein for accepting the extremities of a spindle bearing a roll of toilet-tissue, said device comprising:

a shelf element of given area and shape adapted to be positioned horizontally and mount thereon at least one object;

means incorporated with said shelf element for holding said object against inadvertent displacement;

a plurality of rigid arm means at least one end of which is attached to and projects angularly from marginal portions of said shelf element for releasably engaging at least one given portion of the dispenser; the location of the attachment of said arm means and the angle of their disposition enabling the surface of said shelf element to be substantially free of obstruction for ready placement, removal or manipulation of said object;

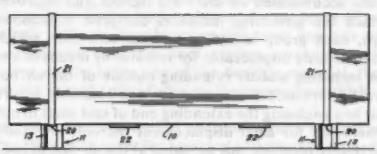
means for holding a rear surface of said supporting device at a position adjacent to a rear surface of said dispenser whereby said shelf element is established at a horizontal position and substantially fixed against movement; and

means for locking said supporting device at said position.

3,943,860
PALLET SKID DEVICE

Francis P. Brennan, 1057 Rolling Drive, Lisle, Ill. 60532

Filed June 1, 1971, Ser. No. 148,636
Int. Cl.² B65D 19/41, 19/00
U.S. Cl. 108—55 4 Claims



1. In a pallet skid device, at least two independent skids, each having an elongated horizontal body portion channel-like in cross section and having legs channel-like in cross section extending downwardly from opposite ends of said body at right angles with respect thereto and formed integrally therewith, the legs having slots extending transversely thereof arranged to accommodate the strapping of an article to be lifted to said body portion by the insertion of strapping means through said slots and about said body portion, to support a load in vertically spaced relation with respect to the ground, and provide a free space between said legs both longitudinally of said skids and transversely thereof and thereby accommodate the forks of a fork lift truck to come into lifting engagement with the bottom of the load from the ends or sides of the load and at angles relative to the ends and sides of the load

without interference by said pallet skid device, said body having beads extending along opposite sides thereof and depending therefrom, forming the body into a downwardly opening channel extending for the length thereof, and said legs having beads extending along opposite sides thereof aligned with the beads extending along the body and extending outwardly of said legs and forming said legs into outwardly opening stiffened channels.

3,943,861
DEVICE FOR OPERATING AIR GOVERNING MEANS AT A REFUSE BURNING FURNACE

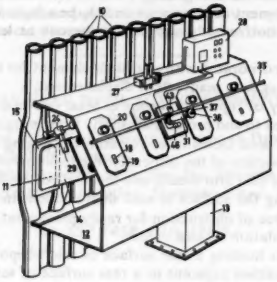
Ingmar Astrom, Stenungsund, and Stig Janson, Goteborg, both of Sweden, assignors to Gotaverken Angteknik AB, Goteborg, Sweden

Filed Dec. 30, 1974, Ser. No. 537,384

Claims priority, application Sweden, Jan. 30, 1974, 7401157

Int. Cl.² F23L *5/00*

U.S. Cl. 110—182.5 **4 Claims**



1. A device for operating air governing means of a refuse burning furnace comprising a number of air admittance ports in its walls, said ports communicating with an air box and each port being provided with a governing member, movable forwards and backwards in relation to said port and including means to determine the volume of air passing through the pertaining port, said member including means adapted to perform a displacement beyond a governing movement and having an inward end penetratable through the port to remove deposits accumulated on the walls thereof, the improvement in which the governing members comprise interconnected groups, each group including at least two units which are simultaneously displaceable for removal by means of a mechanism including a shaft extending outside of the air box, an externally threaded screw member non-rotatably secured to the air box enclosing the extending end of said shaft to cooperate therewith for axial displacement thereof, an axially secured, freely rotatable nut mounted at the air box in cooperation with the screw member and provided with a worm gear wheel, and a rotatable rod extending along said air box having mating worms cooperating with worm wheels at a number of operating mechanisms fitted at the air box.

3,943,862
SUGAR CANE PLANTING APPARATUS

Peter Populin; Louis Populin, both of P.O. Box 19, and Guiseppe Scalia, P.O. Box 316, all of, Home Hill, Australia

Filed Oct. 4, 1974, Ser. No. 511,945

Claims priority, application Australia, Oct. 10, 1973, 5171/73

Int. Cl.² A01C *11/00*

U.S. Cl. 111—3 **9 Claims**

1. A sugar cane planting apparatus comprising

a. means for mounting the apparatus for movement across a field along a planting path;

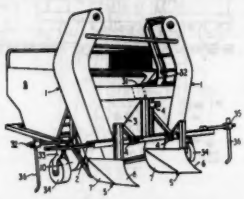
b. a bin for receiving a supply of sugar cane billets;

c. a billet discharge station;

d. a conveyor having an upward run extending upwardly from a billet take-up point within the bin for delivering billets to said billet discharge station;

e. billet supply means included in the conveyor for engaging and conveying said billets and comprising billet supports dimensioned and shaped to support a single billet for delivery to said discharge point;

f. means for transmitting driving force to said billet supply means for supplying said billets sequentially and intermittently to said discharge station;



g. guide means mounted for guiding downward motion of billets from said discharge station, the guide means for delivering the billets for planting with the longitudinal direction of each billet extending substantially parallel to said planting path;

h. said upward run of the conveyor having an upper portion overhanging said bin whereby any second billet lying on top of a first billet supported on a billet support falls back into said bin; and

i. wall means located at said upper portion of said upward run for deflecting back into said bin any billet upstanding from a billet support.

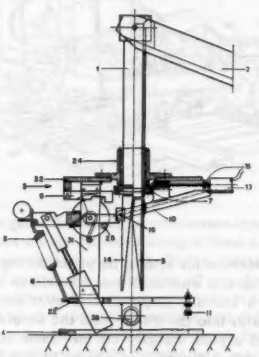
3,943,863
PLANTING MACHINE FOR PLANTING PLANTS IN CLODS

Jean Leonard, Bordeaux, and Georges Touzet, Nangis, both of France, assignors to Union Des Cooperatives Forestieres D'Aquitaine (U.C.F.A.), Bordeaux and Association Foret Cellulose (A.F.O.C.E.L.), Paris, both of, France

Filed June 25, 1974, Ser. No. 482,918

Int. Cl.² A01C *11/00*

U.S. Cl. 111—2 **8 Claims**



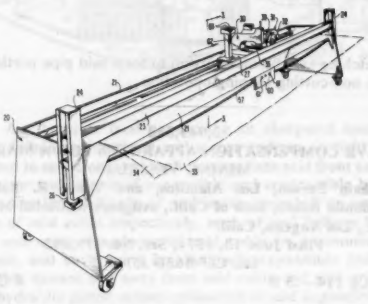
1. A mechanism for planting plants in soil in standard clods comprising a cage means, a planting tube, said tube being guided by said cage means for vertical reciprocatory move-

ment, a support arm adapted for connection to a self-propelled vehicle and being connected to said tube, said support arm having means to reciprocate said tube, jaw means attached to the lower end portion of said tube to produce a hole in soil, means for opening and closing said jaw means upon reciprocation of said tube, soil compacting weights connected by cam means to said cage means, means for raising said weights when said tube descends and for releasing said weights when said tube ascends to compact soil about a plant inserted into said hole, said latter means including said cam means positioned for actuation by reciprocating movement of said tube.

3,943,864
CARPET SEWING MACHINE

James M. Feighery, and Michael A. Lewallyn, both of Dalton, Ga., assignors to J. M. Feighery Company, Dalton, Ga.

Filed Dec. 16, 1974, Ser. No. 533,343
Int. Cl.[2] D05B *23/00*
U.S. Cl. 112—7 4 Claims

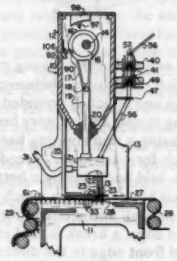


1. A machine for butt seaming two carpet sections comprising a horizontal railway sewing machine frame including spaced parallel frame sides, a vertically movable power operated carpet clamping bar arranged above and extending lengthwise of one frame side for clamping superposed carpet sections in fixed relationship at the top of said frame, a pair of parallel longitudinal tracks on said frame sides below the tops of the frame sides and substantially coextensive lengthwise therewith, a carriage plate having opposite side guide rollers disposed between the frame sides with the guide rollers engaging and supported by said tracks, a sewing machine mounted bodily on the carriage plate between the frame sides and extending transversely of the frame sides and tracks with its sewing head facing one frame side and clamping bar and being approximately at the elevation of the top of said frame, said sewing machine pivoted to the carriage plate on a pivot axis parallel to said tracks whereby the sewing machine may be rocked upwardly on its pivot and rearwardly away from said clamping bar and the underlying frame side, a power driven rotary carpet edge trimmer on the carriage plate closely in advance of the sewing machine and having a transverse horizontal axis cutter blade operating in a vertical plane and spaced slightly laterally inwardly of the sewing head needle means with reference to said clamping bar, said trimmer pivoted to the leading portion of said carriage plate on a pivot axis transverse to said tracks and substantially at right angles to the pivot axis of said sewing machine, a sewing machine drive motor secured to the bottom of the carriage plate and having transmission gearing operatively connected to the sewing machine above said plate, a length of sprocket chain disposed at an elevation below the carriage plate and said tracks and extending lengthwise of said frame with its ends attached to the opposite frame ends, said chain arranged near the frame side having said clamping bar above it, a carriage driving sprocket gear engaged with said chain and operable to propel said carriage plate, sewing machine and trimmer along said tracks, and an electric clutch means coupled between said driving sprocket gear and said sewing machine drive motor whereby said sprocket gear is powered by said clutch means only when said drive motor is energized and is free-wheeling when the motor and clutch means are de-energized.

3,943,865
CONTROLLED DELIVERY OF YARN

Joe T. Short, West Point; Lee H. Knight, Jr., Savannah; Zane Frentress, Chamblee, and Winston C. Boteler, Atlanta, all of Ga., assignors to Deering Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 798,846, Dec. 23, 1968, abandoned, which is a continuation of Ser. No. 535,640, March 7, 1966, abandoned. This application Mar. 6, 1970, Ser. No. 17,312
Int. Cl.[2] D05C *15/18, 15/32*
U.S. Cl. 112—79 R 5 Claims



1. In a tufting apparatus which includes means for moving a backing material along a path of travel, a plurality of yarn carrying tufting needles disposed transverse to said path, means for effecting relative cyclical movement between the needles and the backing material transversely of said path to cause penetration of the needles through and withdrawal of the needles from the backing material during each cycle, and means for feeding different controlled lengths of yarn to said needles to form in the backing material yarn loops of correspondingly different lengths extending from one side of the backing material and yarn back stitches extending between said loops on the other side of the backing material, the improvement in said controlled yarn feeding means which comprises:

feed roller means mounted at fixed feeding stations along the respective yarns for applying a frictional feeding force to individual yarns to move the yarns past said fixed stations,

drive means to rotate said feed roller means through successive substantially uniform time intervals within individual cycles to move successive increments of yarn past said fixed stations, said drive means comprising a plurality of electrical pulse responsing stepping motors, and

means to control the operation of said drive means to selectively vary the number of said time intervals per cycle during which increments of the yarn are fed to form different ones of said loops to thereby vary the number of increments which are fed to said different loops and thus vary the relative lengths of said different loops in accordance with a predetermined pattern, said control means including means for transmission to said stepping motors of selectively variable numbers of electrical pulses.

3,943,866

ROTARY HOOK FOR SEWING MACHINE

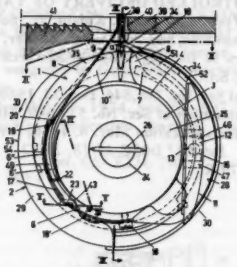
Pierre Joseph Bogaert, Sint-Niklaas, Belgium, assignor to Manta, Waasmunster, Belgium

Filed Oct. 24, 1973, Ser. No. 409,348

Claims priority, application Belgium, Oct. 24, 1972, 790478; Mar. 29, 1973, 797518

Int. Cl.² D05B 57/14

U.S. Cl. 112—228 7 Claims



1. A rotary hook assembly for a sewing machine of the type having a needle which reciprocates between an upper position and a lower position and which is provided with an eye for an upper stitch-forming thread and a rotary hook rotatable about a horizontal axis having a non-rotating basket therein for the reception of a stitch-forming lower thread about which said rotary hook rotates, said hook having a bottom wall extending perpendicular to said horizontal axis which passes through the center of said bottom wall and a circumferential wall extending axially to a front edge, a break in said circumferential wall extending from said front edge in the direction of said bottom wall and defining a beak portion adapted to capture a loop of the upper thread formed at the level of the needle eye when the needle moves upwardly from its lower position to its upper position, said beak portion projecting outwardly relative to the outer hook circumferential wall, said outer hook being further provided with a body-guard attached to the circumferential wall,

the improvement residing in that said beak projects substantially tangentially outwardly relative to the outer hook circumferential wall to an extent which enables it to capture the needle loop of the needle which in its lowest position is outside the interior of the inner basket and said body-guard is provided with a point-shaped end adjacent to and disposed radially inwardly of said beak.

3,943,867

PROCESS FOR THE PRODUCTION OF A HOLLOW BODY OF REVOLUTION AND/OR CONTAINER

Horst-Lothar Erfurt, Furstenfeldbruck; Holger Kreft, Karlsfeld, and Walter Tronsberg, Munich, all of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Germany

Filed July 24, 1974, Ser. No. 491,371

Claims priority, application Germany, July 24, 1973, 2337500

Int. Cl.² B21D 51/24

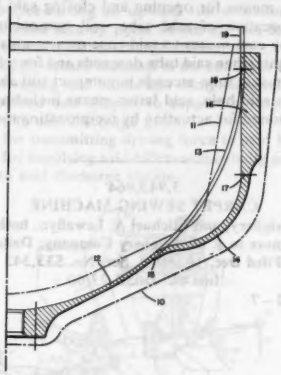
U.S. Cl. 113—120 H 39 Claims

37. Process for producing a thin-walled body of revolution having a cylindrical pipe portion adjoining a dish-shaped bottom convex with respect to said pipe portion comprising:

forming a dish-shaped blank,

forming a bottom portion and an adjoining tubular portion from said blank by a cutting turning operation only, said bottom portion defining a lower part and an upper part, said lower part defining a sector of a sphere, said upper part defining a radially outwardly projecting bulge,

shaping the upper part of said bottom portion to form a hemisphere with the lower part of said bottom portion by a projection stretching step, and



stretching said tubular portion to form said pipe portion by a non-cutting shaping operation.

3,943,868

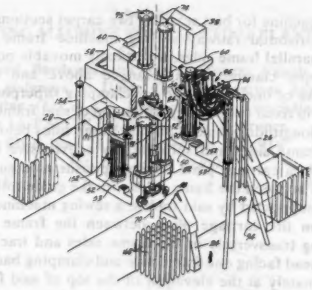
HEAVE COMPENSATION APPARATUS FOR A MARINE MINING VESSEL

Abraham Person, Los Alamitos, and Vance E. Bolding, Redondo Beach, both of Calif., assignors to Global Marine Inc., Los Angeles, Calif.

Filed June 13, 1974, Ser. No. 479,093

Int. Cl.² B63B 35/44

U.S. Cl. 114—.5 D 8 Claims



1. Heave compensation apparatus for supporting a load on a floating vessel subject to periodic and transient short term vertical movements, comprising a pair of hydraulic rams supporting the load on the vessel, each ram including a pair of relatively movable members defining a fluid-tight space that changes in volume with relative movement between the two members, said space being filled with hydraulic fluid, accumulator means connected to said space for receiving hydraulic fluid from and supplying fluid to said space with changes in volume, a source of compressed gas connected to the accumulator means for applying pressure to the hydraulic fluid, the movable member of each of the rams being cylindrical with one member inside the other, the outer ends of the cylindrical members being closed to form a fully enclosed space that varies in volume as the two members move relative to each other, a tube extending into the volume from the outer end of one of the cylindrical members, the tube being secured to said

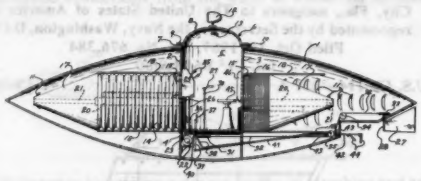
one cylindrical member and providing a fluid passage connecting the enclosed space to the exterior of the ram, whereby fluid may move into and out of the variable volume defined by the two cylindrical members, the other cylinder having an inner wall transverse to the tube to divide the interior space into two regions, the inner wall having an opening through which the tube extends, and means for providing a passage for movement of fluid between the two regions.

3,943,869

SUBMARINE BOAT

Jean-Paul Frechette, 350-6th Ave., LaSalle, Quebec, Canada

Filed Jan. 21, 1975, Ser. No. 542,660
Claims priority, application Canada, Feb. 21, 1974, 193163
Int. Cl.² B63G *8/00*
U.S. Cl. 114—16 E **6 Claims**



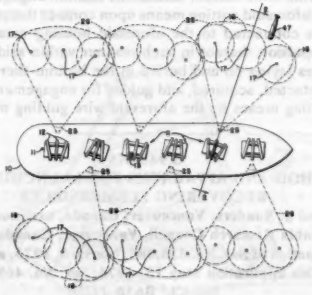
1. A submarine boat comprising an elongated apertured shell defining a front end and a rear end, an air-tight cabin located in said elongated shell intermediate said front end and said rear end, a pair of expandible and contractible bellows extending longitudinally of and inside said shell on opposite sides of said cabin respectively, each of said bellows having one end secured endwise to said cabin in communication therein, and each being longitudinally expandible and contractible toward and away from said cabin and said one end, and hydraulic piston means connected to said expandible and contractible bellows and adapted to selectively expand and contract the latter.

3,943,870

PINGING CONTROLLED ANTI-TORPEDO DEVICE

LeRoy C. Paslay, Dallas, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 24, 1950, Ser. No. 191,908
Int. Cl.² F42B *19/00*
U.S. Cl. 114—20 R **4 Claims**



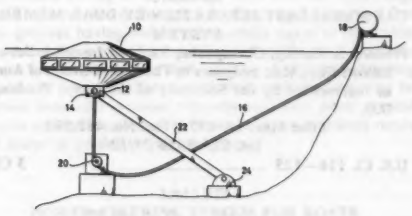
1. A system of the character disclosed for protecting a vessel against torpedo attack comprising a gimbals mechanism including an outer ring pivotally secured to said vessel and an inner ring pivotally secured to the outer ring with the axis of oscillation of the inner ring arranged in a horizontal plane, a pendulum device secured to said inner ring and having the axis of oscillation thereof arranged in registry with a vertical plane through the keel of the vessel when the vessel is on an even keel, a plurality of rocket tubes, means for securing said rocket tubes to said pendulum device in spaced relation with respect to each other and with the longitudinal axes of the tubes arranged at the same predetermined elevation when the vessel is on an even keel whereby rockets projected from said tubes will have substantially the same predetermined fixed range as the vessel rolls and pitches, said rocket tubes also having a divergent angular setting with respect to each other such that rockets projected therefrom will strike the surface of the water to form an overlapping explosive pattern at said predetermined fixed range of sufficient explosive force to destroy an oncoming torpedo within said pattern when the rockets are detonated, a directional sound emitting and echo detecting means arranged on the vessel with the field of sound emission and detection thereof projecting outwardly from the side of the vessel, said emitting and detecting means emitting sound signals into the water in the path of travel of said oncoming torpedo and thereafter receiving the reflected signals therefrom, heterodyne means for beating the reflected sound signals with the emitted sound signals to derive differential frequency signals representative of the speed of the oncoming torpedo, filter means responsive to the output of said heterodyne means for passing only differential frequency signals representative of a predetermined range of speeds, time measuring circuit means operatively connected to receive said emitted signals and the differential frequency signals passed by said filter means for measuring the elapsed time between the emitted signals and their respective differential frequency signals passed by said filter means, said measured elapsed time corresponding to the distance of the torpedo from the vessel, and electroresponsive means operatively controlled by said time measuring circuit means to ignite the propellant charge of rockets disposed within the tubes when the torpedo moves into said pattern.

3,943,871

SUBMERGING SYSTEM FOR MARINE STRUCTURE

Kazuhide Tanaka, No. 3743, Izumi-cho, Totsuka, Yokohama, Kanagawa, Japan

Filed Mar. 22, 1974, Ser. No. 453,581
Int. Cl.² B63C *11/00*
U.S. Cl. 114—66 **2 Claims**



1. Apparatus for maintaining a marine structure at a selected depth and in a substantially fixed position within a body of water and comprising a flotation, air tight, capsule, anchoring means comprising lever means pivoted non-rotatably at one end thereof to a bottom end portion of said capsule, a mooring block permanently fixed to the bed of said body of water and having the opposite end of said lever means connected thereto pivotally about a horizontal axis and nonrotatably, and a land based winch means for raising and lowering said marine structure within said body of water and, in cooperation with said lever means, for maintaining said marine structure at a selected depth and lateral distance from said mooring block in a substantially fixed vertical plane said winch means including a winch fixed to the land, a length of cable con-

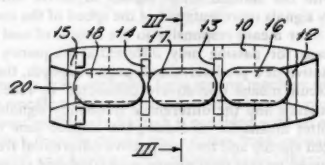
nected between the bottom end of the capsule and said winch, and pulley means permanently fixed to said water bed underlying the capsule, said cable extending substantially vertically downwardly from said capsule to be operatively connected about said pulley means and thence to said winch, whereby said winch may be operated to position said marine structure at the desired depth and said lever means and cable cooperate to maintain said structure at the selected depth and lateral distance from said mooring block.

3,943,872

SHIP FOR THE TRANSPORT OF LIQUID OR GASEOUS CARGO IN TANKS

Joan Charles de Does, Maasland, Netherlands, assignor to Verolme Verenigde Scheepswerven B.V., Rotterdam, Netherlands

Filed Mar. 22, 1974, Ser. No. 453,785
Claims priority, application Netherlands, Mar. 23, 1973, 7304083
Int. Cl.² B63B 25/08
U.S. Cl. 114—74 R 5 Claims



1. A ship for the transport of liquid or gaseous cargo in tanks, comprising

A. a plurality of supporting hulls,

B. a plurality of cargo tanks for liquefied gas, and

C. a superimposed connection structure connecting said hulls and maintaining said tanks in a protected environment spaced above and between said hulls and accessible from all sides;

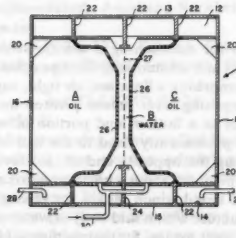
said hulls being disposed at least in part below the water line of said ship, said connection structure being disposed at least in part above said water line, and said tanks being disposed entirely above said water line.

3,943,873

CARGO/BALLAST SEPARATION BY DUAL MEMBRANE SYSTEM

Frederic S. Hering, Chesapeake, Va., and Joseph I. Schwartz, Ellicott City, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 18, 1974, Ser. No. 452,082
Int. Cl.² B63B 25/12
U.S. Cl. 114—125 3 Claims



1. A ship ballasting system separating the oil cargo and the water ballast sections comprising:

a substantially closed oil tank having an overhead structure, bulkheads, and a bottom;

a liquid cargo connection communicating with the oil cargo sections of said tank;

a ballast connection communicating with the ballast sections of said tank; and

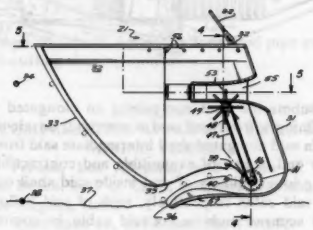
a pair of flexible membranes attached in sealing relationship to said overhead structure, bulkheads, and bottom of said tank at the quarter-points thereby separating said oil tank into cargo sections and a ballast section; and a lightweight perforated bulkhead attached at said overhead structure, bulkheads, and floor at the vertical centerline of said oil tank between said pair of flexible membranes.

3,943,874

RIVER MINE COUNTERMEASURE DEVICE

Edward L. Pipkin, and William H. Tolbert, both of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 16, 1967, Ser. No. 676,384
Int. Cl.² B64B 9/00
U.S. Cl. 114—221 A 12 Claims



1. Means for acquiring and cutting marine mine control wires laying on and buried in the bottom of a river:

a housing means;

passageway means of predetermined geometrical configuration located in said housing means for the controlled flow of river water therethrough;

cutting means mounted for rotation in said housing;

means mounted in said housing and extending within said passageway means for rotation therein in response to river water flowing therethrough;

means interconnecting said water responsive rotating means and the aforesaid cutting means for the driving thereof thereby;

means connected to said housing means for guiding the marine mine control wires to be cut into engagement with the aforesaid cutting means upon contact therewith; and

means connected to the aforesaid housing means for the propulsion thereof in such manner within said river that wires laying on and buried in the bottom thereof will be contacted, acquired, and guided for engagement with said cutting means by the aforesaid wire guiding means.

3,943,875

METHOD AND APPARATUS FOR LAUNCHING AND RECOVERING SUBMERSIBLES

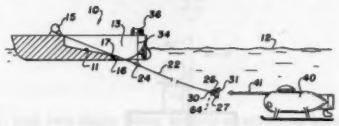
Raymond J. Sanders, Vancouver, Canada, assignor to British Columbia Research Council, Vancouver, Canada

Continuation of Ser. No. 338,085, March 5, 1973, abandoned. This application May 13, 1974, Ser. No. 469,556
Int. Cl.² B63B 21/56
U.S. Cl. 114—235 B 19 Claims

1. A method of recovering a small self-propelled submersible in water by means of a probe element releasably latchable with a drogue element, one of said elements being connected to the end of a cable which extends downwardly and horizontally to said one element and the other of said elements being

connected to the submersible, comprising moving that element connected to the cable horizontally through the water at such a speed that the velocity, weight and length of the downwardly and horizontally extending cable maintain the latter element at a level below the surface of the water where comparatively stable conditions exist and where the movement of the latter element is essentially independent of vertical movements at the surface of the water and the latter element presents a rearwardly facing receiving means as it is moving, moving the other of said elements horizontally to said first element at a little greater speed and in line with said first element until latching together of said elements occurs upon said horizontal movement, to connect the submersible to the cable at said level, the latching resulting from said horizontal movements being effective to prevent further relative motion between the probe and drogue.

11. Apparatus for launching and recovering a small self-propelled submersible from the water in which the submers-



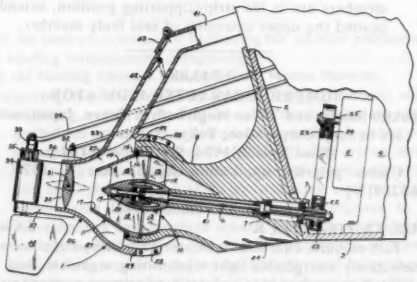
ible operates comprising a drogue having an attaching end and a rearwardly facing receiving end, a cable connected at its free end to said attaching end and extending downwardly and rearwardly from a recovery vessel to the drogue, the drogue constructed of a shape with an apex and a rearwardly increasing outer cross-section to provide stable towing characteristics, the length of the cable and the buoyancy and shape of the drogue and cable constituting means for maintaining the drogue at a desired level below the surface of the water and for keeping the drogue independent of the vertical movements of the surface vessel due to wave movements at the surface of the water as the drogue moves horizontally through the water at said level, a horizontally extending prove connected to the submersible, and a releasable latch means having co-operating parts within the drogue and on the probe for inserting the probe horizontally into the drogue to releasably connect the submersible to the dorgue and the cable such that relative motion between the probe and drogue are prevented.

3,943,876

WATER JET BOAT DRIVE

Elmer Carl Kiekhaefer, Winter Haven, Fla., assignor to Kiekhaefer Aeromarine Motors, Inc., Fond du Lac, Wis.

Filed Dec. 6, 1973, Ser. No. 422,334
Int. Cl.² B63H *11/00*
U.S. Cl. 115—12 R **11 Claims**



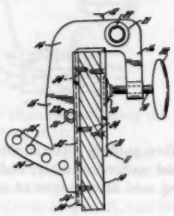
1. A water jet drive for a boat, adapted to be secured to the back of the boat transom to be driven by an inboard powered shaft extending through a sealed opening in the transom near the bottom of the boat and comprising when installed on a boat, a tubular housing fixedly secured to the boat transom and having an open water pickup inlet at its forward end facing downwardly at the general level of the bottom of the boat and to the rear of the transom, said housing extending rearwardly and upwardly from said inlet and having an impeller chamber terminating in a jet nozzle generally above the plane of the bottom of the boat and disposed axially at a slight angle rearwardly and upwardly of said plane whereby the water flows in a substantially straight path upwardly and rearwardly from said inlet to and through said nozzle, a substantially non-flexible drive shaft extending through the boat transom and into said impeller chamber axially of said jet nozzle, and an impeller carried by said shaft in said impeller chamber.

3,943,877

OUTBOARD MOTOR MOUNTING SYSTEM

Kenneth C. Kemp, 3157 E Ave. I No. A4, Lancaster, Calif. 93534

Filed Feb. 6, 1975, Ser. No. 547,562
Int. Cl.² B63H *21/26*
U.S. Cl. 115—17 **3 Claims**



1. A boat transom mounting plate arrangement for removably supporting an outboard motor having a pair of U-shaped clamps which each have one arm with an adjustable clamping screw and a second substantially straight arm spaced therefrom comprising a first mounting plate secured on the rear side of said transom and having an upper edge substantially flush with the upper edge of said transom, said first plate being formed with a pair of spaced apart vertical grooves extending downwardly from the upper edge of said plate a second plate means mounted on the front side of said transom, said second plate means having an upper edge flush with the upper edge of said transom and defining a pair of recessed areas, said first plate grooves having widths substantially equal to the widths of said flat clamp arms for receiving and guiding said arms into precise lateral position on said transom so that said clamping screws are laterally aligned with said recesses and may be screwed into said recesses whereby said first plate vertical grooves and said second plate means recesses positively retain said motor in predetermined position.

3,943,878

POWER STEERING SYSTEM FOR BOATS

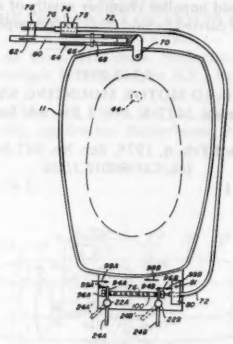
Creal E. Kirkwood, Rte. 1, Box 353C, Wagoner, Okla. 74467, and Veral V. Bauer, 6741 S. Birmingham, Tulsa, Okla. 74136

Filed Sept. 9, 1974, Ser. No. 497,536
Int. Cl.² B63H *25/42*
U.S. Cl. 115—35 **4 Claims**

1. Power steering system for outboard motors or inboard-outboard power units, comprising:

a. a motor assembly having a power shaft and gears driving a propeller mounted on a horizontal rearward extending shaft, the motor assembly adapted for rotation about a hinge means having a vertical axis, said axis of rotation on the side of said motor assembly opposite to that of said propeller, said hinge means being adapted to be clamped to the stern of a boat;

b. at least one control rudder means mounted on a vertical axis aft of said propeller and positioned in the slip stream of said propeller;
c. a tubular socket attached to the forward portion of said motor assembly, the socket having a longitudinal slot therein;
d. a cylindrical elongated arm means slidably received in said socket, the arm means being actuatable by a user;
e. a pin affixed to said arm means slidably received in said slot in said socket providing limited movement of said



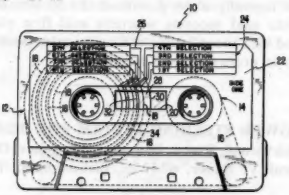
arm means before guiding force is applied to said socket and thereby said motor assembly; and
f. means coupling said arm means to said control rudder means;
whereby when said arm means is pushed in one direction it will cause said rudder to rotate counterclockwise with respect to said motor assembly, whereby force of the slip stream on said rudder will cause torque to be applied to said motor assembly to rotate said motor assembly in a clockwise direction and vice versa.

3,943,879

TAPE CARTRIDGE INCLUDING EDGE MARKED MAGNETIC TAPE

Wayne B. Stone, Jr., 7307 Nevis Road, Bethesda, Md. 20034, and Alan Beaumont, 359 Wildwood Road, Stamford, Conn. 06903

Division of Ser. No. 199,475, Nov. 17, 1971, Pat. No. 3,810,246. This application Mar. 28, 1974, Ser. No. 455,918
Int. Cl.² G08B *5/14*
U.S. Cl. 116—67 A **1 Claim**



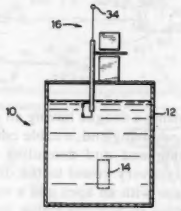
1. A tape cartridge, comprising; a generally rectangular housing having a viewing opening there-through; rotatable reel means mounted within said housing; a length of recordable tape wound on said reel means; said recordable tape having a recordable surface extending substantially entirely across the width thereof; cue means for visually locating desired segments of the total tape length in the wound condition of the tape during winding and unwinding of the tape from the reel means including a plurality of cue markings along and confined only to a path including a side edge of the wound tape and a few thousandths of an inch of the side adjacent thereto defining a plurality of circular bands substantially concentric with the axis of rotation of said rotatable reel means and viewable through said viewing opening; and each said circular band being radially spaced from a next adjacent band by an unmarked length of said tape side edge whereby each spaced cue band comprises a cue reference mark relative to and contrasted with the adjacent unmarked tape length, the appearance and disappearance of said circular bands during winding and unwinding respectively comprising an indication of the desired segment.

3,943,880

ETCH TIMING DEVICE

Ferdinand M. Svirklys, Toronto, Canada, assignor to Dominion Al-Chrome Corporation, Toronto, Canada

Filed Sept. 30, 1974, Ser. No. 510,297
Int. Cl.² G01N *31/00*
U.S. Cl. 116—114 R **5 Claims**



1. An etch timing device comprising
first and second etchant-resistant support members adapted to cooperatively support a strip of etchant-consumable material therebetween in a bath of etchant,
an elongate body member of etchant-resistant material adapted to be mounted in fixed position association with the bath of etchant, said body member having an axial bore formed therethrough, and
a movable rod-like member of etchant-resistant material and extending through the axial bore in said body member and axially movable in sliding relation to said body member,
one of said support members being mounted on said body member and the other of said support members being mounted on the lower end of said movable rod-like member,
said support members being located external of the body member in straight line alignment and parallel to the axis of the bore in said body member,
said rod-like member, when said first and second support members are in the strip-supporting position, extending beyond the upper extremity of said body member.

3,943,881

NUMERIC CHARACTER INDICATOR

Takizo Shiota, and Takao Mogi, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 3, 1974, Ser. No. 476,154
Claims priority, application Japan, June 2, 1973, 48-65259[U]
Int. Cl.² H03J *1/04*
U.S. Cl. 116—124.1 R **5 Claims**

1. A numeric character indicator unit formed of an array of selectively energizable light transmitting segments, said segments being arranged in a plurality of primary segment groups having at least one secondary segment group interposed therebetween, means for selectively energizing the segments in said secondary group and segments in at least one adjacent primary group to display single-digit numerals 1 to 9, and means

for selectively energizing the segments in no less than two primary groups of segments to display two-digit numerals 10

to 99, said two digits being spaced apart by at least one of a primary and secondary group.

3,943,882

DEVICE FOR ADJUSTING AND INDICATING THE RELATIVE POSITION OF SKI BINDING COMPONENTS

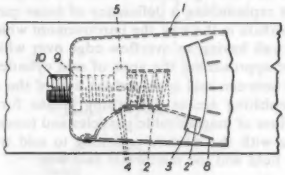
Johann Sollak, Schwechat, and Otto Waczek, Kaltenleutgeben, both of Austria, assignors to Gertsch AG, Zug, Switzerland

Filed June 12, 1974, Ser. No. 478,583

Claims priority, application Austria, June 19, 1973, 5398/73

Int. Cl.² G09F *9/00*; A63C *9/00*

U.S. Cl. 116—124 R **5 Claims**



1. An indicator device for indicating the relative position of ski binding components, comprising:

a ski binding element having indicia means thereon;

adjusting means mounted on said ski binding element, said adjusting means including movable carriage means supported for movement relative to said ski binding element in response to an adjustment of said adjusting means; and

a leaf spring secured at one end to said ski binding element and slidingly engaging at its central zone said carriage means, said leaf spring being flexed in response to a movement of said carriage means, the other end of said leaf spring being a free end which is positioned adjacent said indicia means to define an indicator and being movable in response to a flexing of said leaf spring so that a movement of said free end of said leaf spring relative to said indicia means in response to a flexing of said leaf spring will indicate said relative position of said ski binding components.

3,943,883

UHF TUNER CHANNEL INDICATING DEVICE

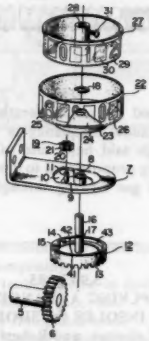
Hideo Ishigami, Yokosuka, and Masaaki Goto, Yokohama, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 18, 1973, Ser. No. 425,709

Claims priority, application Japan, Dec. 23, 1972, 47-2980

Int. Cl.² H03J *1/02*

U.S. Cl. 116—124.1 R **8 Claims**



1. A UHF tuner channel indicating device comprising:

a channel switching shaft;

a rotary device including a first gear directly rotatable together with said channel switching shaft, and an indicator drive means including an indicator drive shaft transverse to said channel switching shaft, said indicator drive means having a crown gear in mesh with said first gear of said rotary device and said crown gear being fixed to said indicator drive shaft for driving said indicator drive shaft by said channel switching shaft;

a first cylindrical indicating drum having an indication section on a peripheral surface thereof for indicating unit digits, said first cylindrical indicating drum being fixed for direct rotation with said indicator drive shaft;

a second cylindrical indicating drum having an indication section on a peripheral surface thereof for indicating tens digits, said second cylindrical indicating drum having a diameter greater than that of said first drum and being mounted coaxially about said first cylindrical indicating drum with at least a portion of the peripheral surfaces of each of said first and second indicating drums being mutually overlapping with portions of the peripheral surface of at least one of said drums being transparent such that a two digit UHF channel indicating number is displayed, and said second indication drum being rotatable with respect to said indicator drive shaft; and

intermittent gear means for operatively connecting said second drum to said indicator drive shaft for intermittently rotating said second indicating drum by transmitting the rotation of said indicator drive shaft to said second drum for only one-tenth of a turn of said crown gear, so that said UHF channel indicating number is progressively displayed as said channel switching shaft is turned.

3,943,884

FLUIDIC FREQUENCY GENERATOR

Charles Peter Majkrzak, 34 Roosevelt St., Nutley, N.J. 07110

Filed Jan. 21, 1974, Ser. No. 435,362

Int. Cl.² G01F *1/66*

U.S. Cl. 116—137 R **9 Claims**

1. A fluidic frequency generator comprising:

a helix of wire having predetermined dimensions;

a sleeve of selected material disposed to encircle and conform to the exterior surface configuration of said helix; and

means containing a pressurized gas having a pressure greater than the atmosphere, said means being coupled to one end of said helix and said sleeve to direct said pressurized gas for flow through said helix and said sleeve from said one end to the other end of said helix and said sleeve;

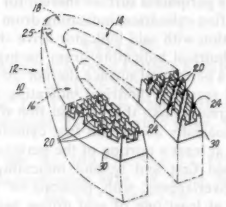
said helix and said sleeve cooperating to provide at said other end an audio frequency in response to said gas flowing through said helix and said sleeve, said audio frequency being proportional to a predetermined characteristic of said gas flowing through said helix and said sleeve.

3,943,885

ADHESIVE APPLYING ARRANGEMENT FOR THE INSOLES OF SHOES

Derek H. Garner, Leicester, and Robert C. Quarmby, Groby, both of England, assignors to USM Corporation, Boston, Mass.

Filed Feb. 20, 1975, Ser. No. 551,284
Int. Cl.² B05C 5/02
U.S. Cl. 118—411 **5 Claims**



1. A shoe machine having an adhesive applying arrangement comprising:

an adhesive applying member having a generally U-shaped shoe bottom confronting surface having end regions provided with a plurality of generally V-shaped grooves in said surface extending generally lengthwise with respect to a shoe disposed therewith;

said V-shaped grooves having a network of openings therein through which molten adhesive is extruded;

said V-shaped grooves in said surface being interrupted by generally crosswise extending channels, said channels being disposed deeper in said surface than said V-shaped grooves; and

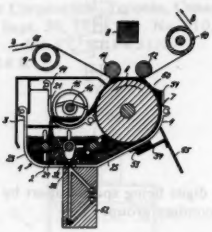
said V-shaped grooves being separated from one another by another array of channels extending generally lengthwise of said adhesive applying member, whereby surplus adhesive may be drawn away from the V-shaped grooves into either channel arrangement.

3,943,886

DEVELOPING APPARATUS FOR ELECTROSTATIC CHARGE IMAGES

Mathias J. J. M. Vola, Sittard; Gerardus A. J. Koeleman, Velden, and Franciscus M. J. Peeters, Grubbenvorst, all of Netherlands, assignors to Oce-van der Grinten N.V., Venlo, Netherlands

Filed Dec. 16, 1974, Ser. No. 532,843
Claims priority, application Netherlands, Dec. 17, 1973, 7317261; Mar. 27, 1974, 7404121
Int. Cl.² G03G 15/08
U.S. Cl. 118—637 **16 Claims**



1. In apparatus for developing an electrostatic charge image on a support by applying thereto a powder mixture of magnetizable carrier particles and toner particles, comprising a tray for holding a quantity of said mixture, said tray having a bottom wall, two side walls, a front wall and a rear wall, magnetic brush forming means including a cylinder mounted for rotation between said side walls in bearings thereon near said rear wall and a permanent magnet disposed above said cylinder, means for transporting said support over said cylinder through a magnetic field between said cylinder and said magnet, at least two mixing elements mounted for rotation between said side walls in bearings thereon near said bottom wall, and means for replenishing a deficiency of toner particles in the powder mixture in the tray, the improvement which comprises said rear wall having an overflow edge over which an excess of powder approaching the apex of said cylinder will escape at a level between said apex and the axis of the cylinder, and said replenishing means comprising means for supplying a fresh mixture of magnetizable particles and toner particles for admixture with the mixture returning to said tray from said magnetic field and the mixture in said tray.

3,943,887

HYBRID CROSSMIXER

Richard E. Smith, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

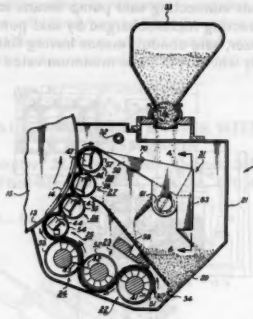
Filed Feb. 27, 1975, Ser. No. 553,756
Int. Cl.² G03G 15/08
U.S. Cl. 118—637 **12 Claims**

1. In a development system for developing latent electrostatic images carried by an imaging surface of an electrostatographic processor; said development system including a sump for storing a supply of developer having toner and carrier components, said means for circulating said developer along a predetermined path running from said sump, through a development zone, and then back to said sump; the improvement comprising

a hybrid crossmixer having parallel active and passive sections positioned in said path, and

flow splitting means in said path upstream of said crossmixer for dividing the circulating developer so that part passes through the active section of said crossmixer while

another part passes through the passive section, whereby the toner and carrier components of said developer are



simultaneously subjected to efficient blending and mixing.

3,943,888

PIPELINE MILKING SYSTEM

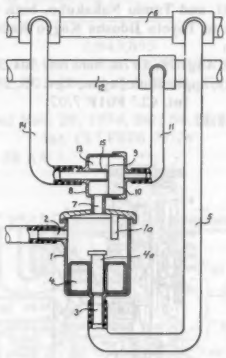
Sven-Ake Nordegren, and Karl Erik Olander, both of Sodertalje, Sweden, assignors to Alfa-Laval AB, Tumba, Sweden

Filed Oct. 1, 1974, Ser. No. 510,999

Claims priority, application Sweden, Oct. 30, 1973, 7314705

Int. Cl.² A01J 9/00

U.S. Cl. 119—14.05 **3 Claims**



1. In a pipeline milking system, the combination of a milk transport conduit, a working vacuum source, a control vacuum source, and a venting arrangement comprising a receptacle hermetically separated from the control vacuum source and having a milk inlet for connection to a milking means, the receptacle also having a milk outlet connected to the milk transport conduit, means operable to sense the milk level in the receptacle for controlling the milk outlet, the receptacle also having an air outlet, and reducing means connecting the air outlet to the working vacuum source, the reducing means including a control valve connected to the control vacuum source and operable to control the vacuum in the receptacle in relation to the control vacuum.

3,943,889

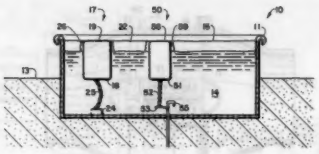
HEAT DISTRIBUTING TANKS FOR RETARDING SURFACE FREEZING

Frederick J. Sparber, R.D. 1, Box 192-A, Belen, N. Mex. 87002

Filed Mar. 28, 1975, Ser. No. 562,971

Int. Cl.² A01K 7/00

U.S. Cl. 119—73 **17 Claims**



1. Apparatus for preventing ice from forming on a surface of a body of water, comprising:

a heat conducting tank to float in said water with a top portion adjacent said surface, and

a fluid only partially filling said tank,

said fluid having a boiling temperature less than zero degrees centigrade to produce a vapor of said fluid within said tank when said tank is in said water to carry heat from a warmer lower portion of said tank to a cooler upper portion of said tank, to prevent ice from forming adjacent said upper portion,

said tank having sides extending smoothly and continuously essentially vertically downward to the warmer lower portion of said water, whereby said tank remains movable if ice forms in said water.

3,943,890

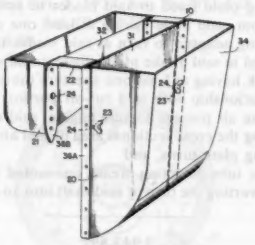
HORSE TRAILER WASTE UNIT

Hank A. Calia, Calabasas, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Dec. 16, 1974, Ser. No. 533,069

Int. Cl.² A01K 23/00

U.S. Cl. 119—95 **2 Claims**



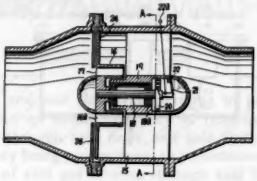
1. An attachable waste catcher unit that may be detachably mounted over the top of the door of a horse stall of a trailer comprising

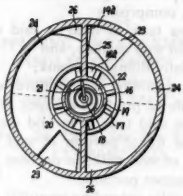
an open flexible inside container, and an open flexible outside container, each joined to parallel legs of a pair of spaced U-shaped strap members, that are shaped to fit over the top edge of a horse stall trailer door said containers being made of a plastic material whereby each container maintains a flexible opening to receive waste and said inside container has a downwardly tapered wall means.

3,943,891
AIR-FLOW METERING DEVICE FOR FUEL INJECTION SYSTEM OF INTERNAL COMBUSTION ENGINE

Masumi Kinugawa, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed June 27, 1974, Ser. No. 483,909
Claims priority, application Japan, Aug. 9, 1973, 48-89857
Int. Cl.² G01F *1/28*
U.S. Cl. 123—32 EA **2 Claims**





1. An air-flow metering device for a fuel injection system of an internal combustion engine comprising;

a retaining member fixed in an intake pipe of the engine so as not to interrupt air flowing therethrough into the engine,

a shaft rotatably supported by said retaining member,

a plurality of radial blades fixed to said shaft in said intake pipe, said blades having an angle of attack against a stream line of air flowing through said pipe so as to be turned by the lifting force produced by said air impinging on the blades,

a metering plate fixed to said blades to extend outwardly therefrom, said plate having at least one cut-off portion and being adapted to turn as said blades turn;

a disk fixed in said intake pipe adjacent said metering plate, said disk having at least one aperture therein in cooperative relationship with said cut-off portion for forming at least one air passage to said engine, said cut-off portion changing the cross sectional area of said air passage as the metering plate turns, and

an electric turn detecting means connected with said shaft for converting the turn of said shaft into an electric signal.

3,943,892
INJECTOR

Willem Brinkman, Velp, Netherlands, assignor to Holec N.V., Hengelo, Netherlands

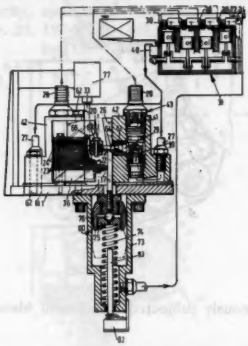
Filed Mar. 19, 1974, Ser. No. 452,619
Claims priority, application Netherlands, Nov. 16, 1973, 7315770
Int. Cl.² F02B *3/00*
U.S. Cl. 123—32 EA **17 Claims**

1. In combination with an internal combustion engine provided with a fuel atomizer having a pressure-responsive outlet valve;

electrically actuated pump means for discharging fuel at intermittent intervals and at increasing volumetric rate during each such interval;

control means for varying the quantity of fuel discharged by said pump means during said intervals in accord with operating conditions of the engine;

conduit means connecting said pump means to said atomizer for directing fuel discharged by said pump means to said atomizer, said conduit means having finite volumetric capacity whereby at some minimum value of the quantity of fuel discharged by said pump means as controlled by said control means said atomizer can no longer adequately atomize the discharged fuel; and

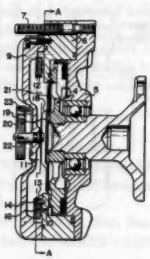


switch means actuated in consonance with said control means for deenergizing said pump means when said pump means would otherwise discharge said minimum value quantity of fuel.

3,943,893
FLUID COUPLING FOR AN INTERNAL COMBUSTION ENGINE

Yousuke Tsubaki, and Tamio Nakakubo, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Aug. 28, 1974, Ser. No. 501,300
Claims priority, application Japan, Apr. 30, 1974, 49-47623
Int. Cl.² F01P *7/02*
U.S. Cl. 123—41.12 **4 Claims**



3. A coupling assembly comprising a rotor adapted for connection to a driving member, a first casing adapted for connection to a member to be driven, said first casing surrounding said rotor and cooperating with said rotor to define a first reservoir, a coupling fluid disposed in said first reservoir for transferring the torque of said rotor to said casing, a second casing fixed to said first casing and cooperating with said first casing for defining a second reservoir for said fluid, a plurality of openings extending through said first casing and communicating said reservoirs for permitting said fluid to pass from said first reservoir to said second reservoir to reduce the amount of torque transferred from said rotor to said first

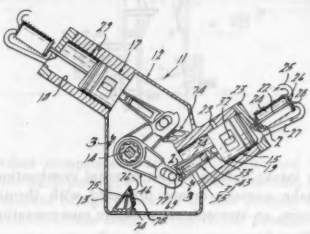
casing, and an annular shaped inertia valve means disposed in a coaxial relationship to said rotor, said valve means being connected relative to one of said casings and adapted to rotate relative to said openings in response to angular acceleration of said rotor for selectively controlling the amount of fluid passing from said first reservoir to said second reservoir and thus controlling the amount of said torque transferred.

3,943,894

INTERNAL COMBUSTION ENGINE WITH CLUTCH TRANSMISSION

Willie J. Sumpter, 2133 Montclair, Detroit, Mich. 48214

Filed May 16, 1974, Ser. No. 470,402
Int. Cl.² F02B *75/26*
U.S. Cl. 123—54 R **8 Claims**



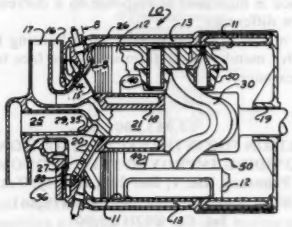
1. In an internal combustion engine, a plurality of pistons, each piston having a connecting rod fixed thereto, a rotatably mounted crankshaft, a plurality of one-way ratchets on said crankshaft, each ratchet being in the plane of a connecting rod, a pawl arm for each piston rotatably carried by said crankshaft, pawls carried by each pawl arm and engageable with said ratchet, and a pin-and-slot connection between each pawl arm and its connecting rod.

3,943,895

BARREL TYPE INTERNAL COMBUSTION ENGINE

Roy M. Howell, 115 Meadbrook Road, Garden City, N.Y. 11530

Filed Nov. 29, 1974, Ser. No. 528,342
Int. Cl.² F02B *75/26*
U.S. Cl. 123—58 AA **13 Claims**



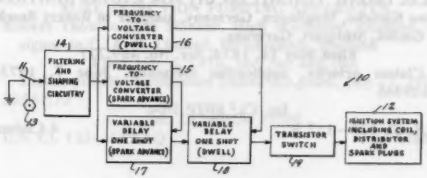
1. An axial cylinder internal combustion engine having a reciprocating piston within each cylinder, a cylindrical cam having a fixed outside diameter, and radially extending camming surfaces; a pair of cam followers each in bearing contact with one of said camming surfaces and coupled to one of said pistons; said cam followers having a tapered surface conforming to the mating surface of said cam; a source of oil under pressure; an oil gallery behind at least one of said cam followers; and means for admitting oil to said gallery to force said one cam follower inwardly and into contact with the camming surface of said cam.

3,943,896

ELECTRONIC CONTROL OF SPARK ADVANCE AND DWELL

Sam J. Green, Temperance, Mich., and Frank J. Raeske, Curtice, Ohio, assignors to Champion Spark Plug Company, Toledo, Ohio

Filed Mar. 13, 1974, Ser. No. 450,828
Int. Cl.² F02P *5/04*
U.S. Cl. 123—117 R **5 Claims**


FREQUENCY-TO-VOLTAGE CONVERTER (DWELL)
FILTERING AND SHAPING CIRCUITRY
FREQUENCY-TO-VOLTAGE CONVERTER (SPARK ADVANCE)
VARIABLE DELAY ONE SHOT (SPARK ADVANCE)
VARIABLE DELAY ONE SHOT (DWELL)
TRANSISTOR SWITCH
IGNITION SYSTEM, INCLUDING COIL, DISTRIBUTOR AND SPARK PLUGS

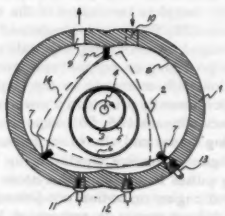
1. In an ignition system for a spark-ignited internal combustion engine including means for generating a timed pulse train synchronized with the engine, said pulse train having a predetermined spark advance curve, and an ignition coil for generating high voltage pulses for firing at least one spark plug in the engine, an electronic timing control circuit comprising, in combination, means for electronically modifying the timing and the pulse width of the engine generated pulse train to obtain a modified pulse train having a preselected modification in the predetermined spark advance curve for all engine speeds and having a predetermined dwell, and switch means responsive to such modified pulse train for controlling current flow in a primary winding of the ignition coil, said modifying means including frequency-to-voltage converter means having an analog output determined by the frequency of the engine generated pulse train, and time delay means responsive to such analog output for delaying the engine generated pulse train by a time increment which decreases linearly as the frequency of the engine generated pulse train increases whereby the preselected modification in the spark advance curve remains constant for all engine speeds.

3,943,897

IGNITION SYSTEM FOR ROTARY PISTON ENGINE

Frank Kenneth Luteran, 10 Charles St., Auburn, N.Y. 13021

Filed Oct. 2, 1974, Ser. No. 511,448
Int. Cl.² F02B *53/12*
U.S. Cl. 123—8.09 **10 Claims**



1. An ignition system for an internal combustion engine having a housing and a rotary piston comprising,
   a. apex seals attached to the rotary piston and contacting the housing wall,
   b. a timing sensor attached to the housing, detecting the position of the seals and producing a timing signal output when the seal is in alignment with the sensor,
   c. variable delay means for electrically delaying the timing signal and producing a delayed timing signal output,

d. high voltage generating means activated by the delayed timing signal and producing a high voltage signal,

e. spark plugs positioned in the combustion chamber, connected to the generating means and producing ignition sparks when the high voltage signal is generated.

3,943,898

ELECTRONIC TIMING CIRCUIT FOR ENGINE IGNITION

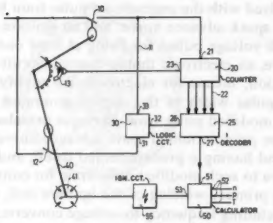
Uwe Kiencke, Moglingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed May 14, 1974, Ser. No. 469,777

Claims priority, application Germany, June 7, 1973, 2329046

Int. Cl.² F02P 5/04

U.S. Cl. 123—117 R **4 Claims**



1. Apparatus for electronic generation of ignition timing pulses for an internal combustion piston engine having a plurality of pistons respectively operating in a plurality of cylinders to drive a common crankshaft, comprising:

means (13) for generating a sequence of pulses corresponding to equal increments of rotation of the crankshaft of the engine such that a multiplicity of pulses is produced during every complete revolution of the crankshaft;

counting means (20) for counting pulses of said sequence, including output means having a plurality of binary digit outputs for providing an output representative of crankshaft position with reference to the upper dead-center point of a permanently preselected piston of said engine;

evaluation circuit means (25, 50) responsive to outputs of said counting means and also to variations of at least one selected engine operation condition, for providing ignition timing pulses to the ignition system of said engine, said selected engine operation conditions, of which said evaluation circuit means is responsive to at least one, being engine speed, a temperature measured in the engine, and a pressure measured in the engine, said evaluation circuit means containing a circuit having logic connections arranged for detecting when said counting means reaches values of count respectively equal to predetermined angles of rotation of said crankshaft from a position in which said preselected piston of the engine is at its upper dead-center point; and

resetting means (10) for resetting said counting means (20) to a count starting condition when said preselected piston of the engine is at its upper dead-center point.

3,943,899

ATMOSPHERIC PRESSURE COMPENSATING MEANS FOR AN ENGINE INTAKE SYSTEM

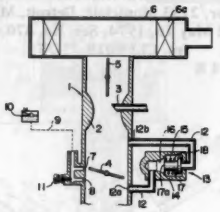
Sadao Matsuoka, Hiroshima; Takashi Takeshita, Hiroshima; Tomoo Tadokoro, and Masami Nakao, both of Hiroshima, all of Japan, assignors to Toyo Kogyo Co., Ltd., Japan

Filed Apr. 3, 1974, Ser. No. 457,546

Claims priority, application Japan, Apr. 6, 1973, 48-42326[U]

Int. Cl.² F02M 7/12

U.S. Cl. 123—119 DB **7 Claims**



1. In an intake system for an internal combustion engine having intake passage means provided with throttle valve means therein, an atmospheric pressure compensating device comprising:

a. air bypass passage means having one end communicating with the intake passage means on the downstream side of the throttle valve means and the other end communicating with the intake passage means on the upstream side of said throttle valve means,

b. control valve means in said bypass passage means for controlling the air flow therethrough,

c. said control valve means including a valve housing defining a valve chamber, and having a valve face and an air inlet, said valve chamber being in communication with said one end of said bypass passage means at said valve face and with said other end of said bypass passage means at said air inlet,

d. a valve member arranged for sliding movement in said valve housing and having one end opposed to said valve face to control a clearance space between said valve face and said valve number one end in response to the pressure difference between the atmospheric pressure and suction pressure in said intake passage means so that said clearance is increased in response to a decrease in said pressure difference,

e. spring means disposed in said valve housing for urging said valve member away from said valve face to increase said clearance.

3,943,900

MODIFICATION FOR INTERNAL COMBUSTION ENGINE PROVIDING IMPROVED FUEL ECONOMY

Ulyuss Lee Primrose, Rte. 1, Box 265, Liberty, Tex. 77575

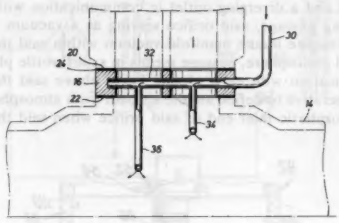
Filed June 17, 1974, Ser. No. 479,641

Int. Cl.² F02H 23/00

U.S. Cl. 123—124 R **1 Claim**

1. An attachment in combination with an internal combustion engine, said attachment installed between a carburetor and an intake manifold of said internal combustion engine, said carburetor is equipped with a throat of specified diameter and said intake manifold has a mating opening to said carburetor, wherein an air-fuel mixture is delivered from said carburetor through said attachment to said intake manifold for distribution of said air fuel mixture through a number of passage means within said intake manifold to cylinders for combustion, said attachment comprising: a generally flat body with upper and lower parallel faces with passages therethrough which align with the throat of said carburetor and the mating

opening of said intake manifold; a first seal, sealingly connecting the upper face of the attachment to a flanged bottom plate of said carburetor and a second seal, sealingly connecting the lower face of said attachment to a mating surface on said intake manifold; and including a tube which continuously injects fresh air into the intake manifold and is open to the atmosphere at one end and passes through a side wall of said attachment and transversely extends across the passages of said attachment and dead ends in one of said passages; said



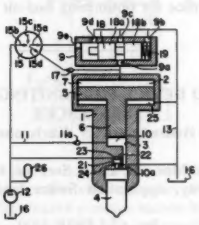
tube further comprises a downwardly directed tee shaped section for each passageway, the vertical section of each tee shaped section being connected to that portion of the tube which extends transversely across each passageway at the approximate center of each passageway, said tee shaped section having a pair of spaced openings at opposite ends of said tee shaped section cross arm and wherein said tee shaped section extends from said attachment to a point within the passage means of said intake manifold.

3,943,901

UNIT INJECTOR FOR A DIESEL ENGINE

Seiji Takahashi, and Nobuhiro Kaibara, both of Higashi-Matsuyama, Japan, assignors to Diesel Kiki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1974, Ser. No. 439,724
Claims priority, application Japan, Feb. 19, 1973, 48-19228
Int. Cl.² F02M *39/00*
U.S. Cl. 123—139 AS **7 Claims**



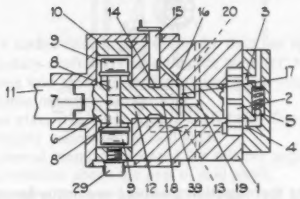
1. A unit injector for a diesel engine comprising, a main body comprising a cylinder, said cylinder having a large diameter portion and a small diameter portion, a servo-piston slidably fitted in said large diameter portion and a pump plunger connected with said servo-piston and slidably fitted in said small diameter portion, a pressurizing chamber being formed between the large diameter portion and the tip of said servo-piston, an injection nozzle connected at the end of said small diameter portion, a pump plunger chamber in communication with said injection nozzle and formed between said pump plunger and said injection nozzle, a fluid element and a spool valve body, said spool valve body being connected with said pressurizing chamber, means for supplying fuel under pressure to said fluid element, said fluid element having at least two outputs for selectively directionally controlling the supplied fuel, means to effect the injection stroke of said pump plunger when the fuel is supplied from one output of said fluid element, said spool valve being actuated by the supplied fuel pressure from another output of said fluid element to discharge the fuel in said pressurizing chamber and to supply the discharged fuel into said pump plunger chamber.

3,943,902

FUEL INJECTION PUMPING APPARATUS

Robert Thomas John Skinner, High Wycombe, England, assignor to C. A. V. Limited, Birmingham, England

Filed July 5, 1974, Ser. No. 486,108
Claims priority, application United Kingdom, July 13, 1973, 33561/73
Int. Cl.² F02M *39/00*
U.S. Cl. 123—139 AQ **4 Claims**



1. A liquid fuel injection pumping means for supplying fuel to an internal combustion engine comprising; an injection pump, means for driving the pump in timed relationship with the associated engine, a feed pump including means for supplying fuel under pressure to the injection pump at a pressure which varies in accordance with the speed at which the apparatus is driven, a throttle member including means for controlling the quantity of fuel supplied to the injection pump and thereby controlling the quantity of fuel supplied to the associated engine, fluid pressure operable means for controlling the timing of delivery of fuel by the injection pump, said fluid pressure operable means comprising a fluid pressure operable piston which is movable against the action of resilient means to advance the timing of injection of fuel to the engine, means for moving the piston by fuel under pressure from the outlet of the feed pump, a fluid pressure operable stop member which when the apparatus is at rest, positions the piston to provide the correct timing of injection of fuel for starting purposes, further resilient means for effecting movement of the fluid pressure operable stop member to position the piston, said fluid pressure operable stop member including a further piston which is loaded by said further resilient means, means for subjecting the further piston to the pressure of fuel at the outlet of the feed pump, the area of the further piston subjected to the outlet pressure of the feed pump being greater than the area of the first mentioned piston which is subjected to the same pressure, means for providing a fluid pressure signal which varies in accordance with the quantity of fluid which is supplied to the engine, a third piston, means for subjecting the third piston to said fluid pressure with the third piston being positioned at the end of said first mentioned piston remote from said further piston, said third piston acting on said first mentioned piston through third resilient means, and said first mentioned resilient means acting on said third piston.

3,943,903

LIQUID FUEL INJECTION PUMPING APPARATUS

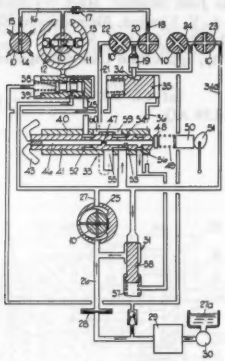
Robert Thomas John Skinner, High Wycombe, England, assignor to C. A. V. Limited, Birmingham, England

Filed July 12, 1974, Ser. No. 488,149

Claims priority, application United Kingdom, July 14, 1973, 33670/73

Int. Cl.² F02M *63/00*

U.S. Cl. 123—139 R 12 Claims



1. A liquid fuel injection pumping apparatus for supplying fuel to internal combustion engines, the apparatus comprising an injection pump adapted to be driven in timed relationship with an associated engine, fluid pressure operable means for effecting adjustment of a component of the injection pump, a feed pump for supplying fuel to the injection pump during the filling periods thereof, a throttle valve for controlling the amount of fuel supplied to the injection pump, a relief valve including a valve member movable by the outlet pressure of the feed pump to an open position in which fuel is spilled from the outlet of the feed pump, resilient means acting to urge the valve member to a closed position, means for generating a first pressure which is lower than the outlet pressure of the feed pump, but which varies in accordance with the speed at which the injection pump is driven, conduit means through which said first pressure is applied to said valve member to assist the action of the resilient means whereby the outlet pressure of the feed pump has a value higher than said first pressure, a further conduit interconnecting the outlet of the feed pump and said means whereby flow of fuel will occur along said further conduit due to the difference in pressure between the ends thereof, a pair of restrictors in said further conduit, a branch conduit extending from intermediate said restrictors, and through which the pressure intermediate said restrictors is transmitted to said fluid pressure operable means, with the size of one of said restrictors being adjustable in accordance with the setting of the throttle valve whereby the fluid pressure applied to said fluid pressure operable means will depend both upon the speed at which the injection pump is driven, and also upon the setting of the throttle valve.

3,943,904

SINGLE INJECTOR THROTTLE BODY

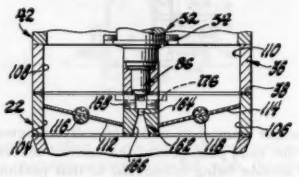
James C. Byrne, Greentown, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed July 19, 1974, Ser. No. 490,223

Int. Cl.² F02M *32/00*

U.S. Cl. 123—139 AW 5 Claims

1. A fuel air induction system comprising a throttle body having opposite ends thereon including an inlet end in communication with atmosphere and an outlet end adapted to be connected to the intake manifold of a vehicle, said throttle body including a converging passage therein with a large diameter at the inlet end of said body and a reduced diameter at the outlet end of said body, a throttle plate secured on the inlet end of said body including a pair of throttle bores therethrough, a throttle valve located in each of said bores, means for producing counterrotation of said valves from a closed idle position to an open position within each of said throttle bores, said throttle plate including a fuel supply orifice therethrough located between each of said bores having an atmospheric inlet end and a diverging outlet in communication with said converging passage, said orifice serving as a vacuum break between engine intake manifold vacuum within said throttle body and atmosphere, passage means in said throttle plate in communication with each of said bores above said throttle valves operative to define an idle air path from atmosphere to said atmospheric inlet end of said orifice when said throttle



valves are in their closed idle position, fuel injector means including a nozzle portion having an outlet and including an outwardly extending pintle movable with respect to said outlet port, means for directing fuel to said nozzle outlet and across said pintle to produce a conical spray pattern therefrom, means for supporting said nozzle portion in coaxially spaced relationship to said orifice to locate said pintle above the atmospheric inlet end to said orifice, said orifice in said throttle plate having its inner wall contoured to receive said conical spray pattern and direct it without interference as a non-sonic, atmospheric spray pattern into said throttle body under reduced intake manifold vacuum conditions, said orifice having idle air directed therethrough from said passage means under increased intake manifold vacuum conditions with said throttle valves in a closed position to produce a sonic idle air flow through said orifice for optimizing fuel-air mixing under idle operation.

3,943,905

METHOD AND DEVICE FOR IGNITING COMBUSTIBLE SUBSTANCES

Gunter Hartig, Hansastrasse 29, Karlsruhe 21, Germany (D-7500)

Filed Mar. 25, 1974, Ser. No. 454,738

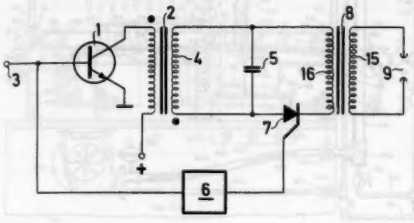
Claims priority, application Switzerland, July 27, 1973, 11022/73

Int. Cl.² F02P *1/00*

U.S. Cl. 123—148 CA 8 Claims

1. An ignition device for an internal combustion engine comprising: an internal combustion engine, an ignition coil having a primary winding and a secondary winding, said secondary winding being adapted to be connected with a spark plug of said internal combustion engine, a source of direct current, a transformer, a first switching means of periodically connecting and disconnecting said source of direct current and the primary winding of said transformer, a capacitor, said capacitor being connected in parallel with the secondary winding of said transformer, the energy developed in said transformer when said switching means is non-conductive being partly transferred to said capacitor, a second switching device having current carrying terminals being connected with said capacitor and with the primary winding of said ignition coil, whereby the stored energy of said capacitor and the

remaining magnetic energy of said transformer is transferred through said second switching device into the primary winding of said ignition coil when said second switching device is biased to a conductive condition, said second switching device



being biased to conduction when the voltage across said capacitor reaches a predetermined value which is substantially lower than the voltage to which said capacitor would be charged by the available energy of said transformer and wherein said second switching device is a diac.

3,943,906

INTAKE SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

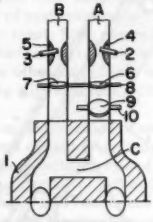
Yutaka Hirose, and Sadao Isomura, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Japan

Filed July 9, 1974, Ser. No. 486,823

Claims priority, application Japan, July 9, 1973, 48-81791[U]

Int. Cl.² F02N *17/00*

U.S. Cl. 123—179 G **6 Claims**



1. Intake system for an internal combustion engine having at least two separated combustion chamber means, said intake system including first intake passage means having first throttle valve means and venturi means, second intake passage means having second throttle valve means and venturi means, means for connecting said first and second intake passage means respectively with said combustion chamber means, communicating passage means for connecting said first and second intake passage means at portions downstream sides of said throttle value and venturi means, shut-off valve means provided in said second intake passage means between said throttle valve means and said communicating passage means, means for opening said throttle valve means of said first intake passage means to a first predetermined opening and closing said shut-off valve means during engine starting and warming-up period, and means for returning said throttle valve means of the first intake passage means to a second predetermined opening which is smaller than said first predetermined opening and simultaneously opening said shut-off valve means after engine warming-up is completed.

3,943,907

THROTTLE RETURN SYSTEMS FOR CARBURETTORS

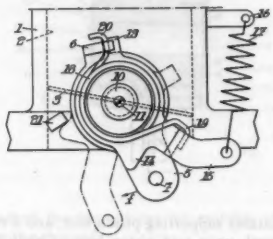
Wilhelm Kluth, Jechen, Germany, assignor to Societe Industrielle de Brevets et D'Etudes S.I.B.E., France

Filed Apr. 2, 1974, Ser. No. 457,262

Claims priority, application France, Oct. 19, 1973, 73.37435

Int. Cl.² F02B *77/08*; F02D *11/04*; B60K *22/08*

U.S. Cl. 123—198 DB **8 Claims**



1. In a carburettor having an intake duct, an operator controlled rotary shaft carrying a throttle member, return means for biasing said shaft towards a minimum opening position of said throttle member, comprising:

a lever plate transverse to said shaft being fixedly and non-rotatably connected to said shaft;

a rotational member mounted for relative angular concentric rotation about the axis of said shaft;

a first spring tensioned between said member and stationary attachment means and exerting on said member a force urging it angularly in the direction of closure of said throttle member;

cooperating abutment means on said lever plate and rotational member for limiting the extent of relative angular movement of said rotational member and lever plate under the action of said first spring;

a torsion spring compressed against said rotational member and exerting a torque tending to rotate it in a direction opposite to that due to said first spring and lower than the torque of said first spring;

and stationary abutment means for limiting the extent of movement of said member under the action of said torsion spring upon failure of said first spring.

3,943,908

ONE PIECE PISTON CONNECTED TO A CONNECTING ROD FOR HIGH SPEED FOUR-STROKE CYCLE INTERNAL COMBUSTION ENGINES

Heribert Kubis, and Gerhard Deschler, both of Nurnberg, Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Nurnberg, Germany

Filed Nov. 2, 1973, Ser. No. 412,441

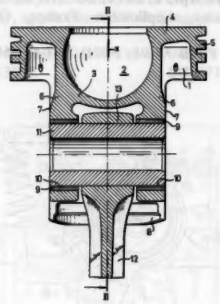
Claims priority, application Germany, Nov. 3, 1972, 2253868

Int. Cl.² F16J *1/14*

U.S. Cl. 123—193 P **6 Claims**

1. In combination for Diesel engines: a one piece piston made of cast iron having a longitudinal axis and having a piston mantle provided in a closed form with a piston bottom and a piston top with a spherical combustion chamber in the central area of said piston top and with peripheral piston ring grooves, said combustion chamber having a constricted opening, said piston also being provided with a piston skirt having two oppositely located flat surfaces located in axially spaced relationship to said piston ring grooves and radially inwardly offset with regard to said piston ring grooves, a hollow piston bolt extending in transverse direction to the longitudinal axis of said piston between said flat surfaces of said piston, said flat surfaces being located parallel to the piston longitudinal axis

and extending vertically at least approximately within the plane of two diametrically opposite outer wall portions of said combustion chamber, bearing means arranged within said



piston and rotatably supporting piston bolt, and a connecting rod firmly shrunk upon said piston bolt so as to be fixedly connected thereto and having overall reduction in compression height realized therewith.

3,943,909

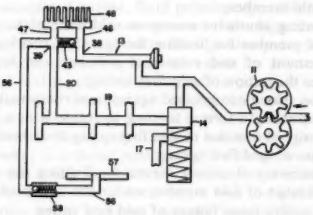
OIL COOLING SYSTEM

Howard J. Palmer, 68 Gaywood Place, Moraga, Calif. 94556

Filed Apr. 26, 1974, Ser. No. 464,647

Int. Cl.² F01M *5/00*

U.S. Cl. 123—196 AB **8 Claims**



1. An improved lubricating cooling system for an engine including a source of pressurized oil and a sump, wherein the improvement comprises: a heat exchanger disposed externally to the engine and provided with an input side connected to the source of pressurized oil and an output side, first pressure relief valve means connected between said input side and said output side of the heat exchanger for bypassing said heat exchanger only at oil pressures above a first fixed value, a supply line connecting said output side of said heat exchanger and the downstream side of said valve means to the lubricating points of the engine, and second pressure relief valve means connected between and heat exchanger output side and the oil sump for bypassing the lubricating points of the engine only at pressures above a second fixed value.

3,943,910

GAS BROILER

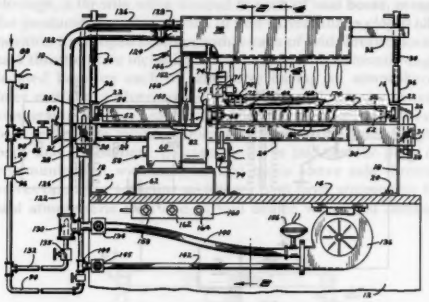
Lyall B. White, 1408 Jacobson Circle, Sun City Center, Fla. 33570

Filed Nov. 11, 1974, Ser. No. 522,596

Int. Cl.² F24C *3/08*

U.S. Cl. 126—41 R **33 Claims**

1. An apparatus for broiling a portion of food, said apparatus including a frame; an elongated, horizontal, downwardly delivering upper heat source having at least one elongated horizontal downwardly delivering heater supported on said frame; a grill for supporting a food portion to be broiled with respect to said frame and below said upper heat source; means adapted to reciprocate said upper heat souce with respect to



said grill and said grill with respect to said upper heat source in a horizontal plane beneath said heat source and transversely of the longitudinal axis thereof in a manner to repeatedly bring all areas of a food portion on said grill into and out of vertical alignment beneath said heat source.

3,943,911

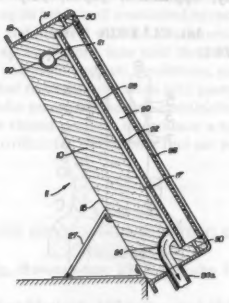
SOLAR HEAT COLLECTOR

Ying-Nien Yu, 1018 Oxford Ave., Marina Del Rey, Calif. 90291

Filed May 31, 1974, Ser. No. 474,934

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **9 Claims**



1. In a solar heat exchanger, the combination comprising

a. a base and an extended metallic surface thereon for facing frontwardly toward the sun, the base including plastic material at the rear side of said metallic surface,

b. means communicating through said plastic material and with said surface to conduct liquid to flow in dispersed condition adjacent the front side of said surface, and

c. a sheet overlying said surface and spaced therefrom sufficiently closely to cooperate therewith for filming the flowing liquid, said sheet adapted to receive solar radiation for promoting heat transfer to the filmed and flowing liquid,

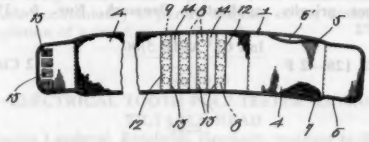
d. a translucent panel overlying said sheet and spaced therefrom, and

e. said base having a portion extending at the peripheries of said panel and sheet to enclose said space therebetween, there being vent means in said base portion to release heat from said enclosed space.

3,943,912
MEDICAL TREATMENT APPARATUS

Takeo Nakayama, 11-19, 5-chome Minamisenju, Arakawa, Tokyo, Japan

Filed Dec. 12, 1973, Ser. No. 423,891
Int. Cl.² A61N 1/42
U.S. Cl. 128—1.3 6 Claims



1. A magnetic medical treatment belly-band adapted to be removably secured to a body of a user or to a portion of the body of said user and wherein magnetic force is utilized to achieve a desired magnetic flux which is caused to act upon the body of the user, comprising, in combination:

a flexible main body having such a length that when it is worn around a portion of the body of said user, the opposite ends overlap each other;

and wherein said flexible main body includes:

a thick rubberized textured layer;

a thinner piece of cloth having a configuration substantially corresponding to that of said thick rubberized textured layer and sewed to one side of said thick rubberized textured layer;

said piece of cloth having a size smaller than that of said rubberized textured layer with respect to the length and width thereof;

a plurality of bristle hook pieces disposed on the side of said cloth piece opposite from said thick rubberized textured layer at one end of said main body;

a plurality of similar bristle hook pieces disposed on the side of said thick rubberized textured layer opposite from said cloth piece at the other end of said main body for selectively interlocking with said first-mentioned bristle hook pieces;

a pocket provided on said one side of said cloth piece adjacent said other end of said main body;

said flexible main body being provided with a plurality of magnet receiving detachment pieces disposed in laterally spaced rows between said rubberized textured layer and said cloth piece in the intermediate section of said main body between the opposite ends thereof;

and medical treatment means including a plurality of laterally spaced magnet rows interposed between said rubberized textured layer and said cloth piece in the intermediate section of said main body between the opposite ends thereof, said medical treatment means being connected to said flexible main body;

each of said magnet rows includes a plurality of vertically spaced magnets;

each said attachment piece having substantially the same thickness as said magnets and having a plurality of vertically spaced holes each receiving one of said magnets;

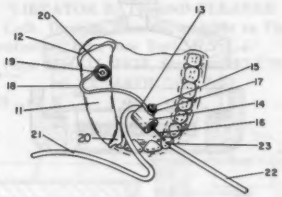
an adhesive tape which is connected to the magnets of each magnet row to hold said magnets in position and which is sewed to said one side of said cloth piece; and

said medical treatment means being disposed on said flexible main body to provide at least one predetermined section on said flexible main body between adjacent magnetic receiving attachment pieces for receiving at least one bone of said user when said belly-band is secured to said user.

3,943,913
APPARATUS AND METHOD FOR DETERMINING TOOTH MOBILITY

Robert J. Johnson, 121 N. Range-Line Road, Carmel, Ind. 46032

Filed June 10, 1974, Ser. No. 477,770
Int. Cl.² A61B 5/10
U.S. Cl. 128—2 S 18 Claims



1. A method for determining the mobility of a tooth and comprising the steps of:

temporarily attaching sensor mounting means to at least one tooth;

supporting a sensor on said mounting means;

placing a probe of said sensor against a surface of a subject tooth whose mobility is of interest;

engaging said subject tooth with a tool and pushing and pulling said subject tooth;

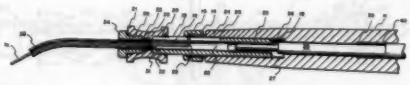
sensing electrically the movement of said probe caused by pushing and pulling on said subject tooth;

and taking the electrical response derived from the electrical sensing step and supplying the response to a recorder and producing on said recorder a graph in accordance with the movement of said subject tooth.

3,943,914
REMOTE-RECORDING PERIODONTAL DEPTH PROBE

James W. Grenfell, 4808 SW. 35th Place, Portland, Oreg. 97221; Fred M. Sorenson, 1193 Troon Road, Lake Oswego, Oreg. 97034; Hiroshi Ueno, 3900 SW. Condor Ave., Portland, Oreg. 97201, and Masato Miyahara, 302 A34 To Otokoyamadanchi, 19 Nagatani Yahataso, Yahata Cho, Tsuzukigun, Kyoto, Japan

Filed Aug. 1, 1974, Ser. No. 493,541
Claims priority, application Japan, Aug. 6, 1973, 48-88229
Int. Cl.² A61B 5/10
U.S. Cl. 128—2 S 15 Claims



1. An apparatus for simultaneously measuring and remotely recording the depth of an anatomical recess comprising:

a. a hand-held depth probe body;

b. a substantially rigid, arcuate probe tip attached to said body for insertion into said recess;

c. a probe tip sleeve partially ensheathing said probe tip and slidably movable relative thereto for contact with the edge of said recess, said sleeve being of flexible material so as to permit said sleeve to conform to the arc of said probe tip as said sleeve is moved therealong;

d. transducer means for converting the position of said probe tip sleeve relative to said probe tip into a signal representing the depth of said recess;

e. means for converting said signal into a permanent record and visual display of said depth; and

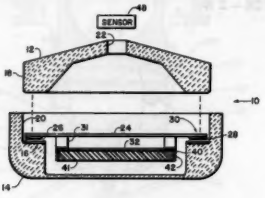
f. means for actuating said signal conversion means on command to produce said record of said depth.

3,943,915

INTRACRANIAL PRESSURE SENSING DEVICE

Gerald R. Severson, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Nov. 29, 1974, Ser. No. 528,118
Int. Cl.² A61B 5/07
U.S. Cl. 128—2 P 9 Claims



9. A body fluid pressure sensor for use internal to a human body, particularly intracranial, comprising:

a. a ceramic housing including an upper and lower member;

b. said upper member having an opening for allowing body fluid ingress, said lower member having an internal cavity;

c. a thin metal diaphragm member affixed at its outer edges to said lower member;

d. a metallized diffusion bond disposed between the thin metal diaphragm member outer edges and said lower member for hermetically sealing said internal cavity;

e. an electrical impedance means located within said internal cavity and coupled to said thin metal diaphragm member, said thin metal diaphragm member constituting a portion of said electrical impedance means and being responsive to body fluid pressure on said thin metal diaphragm member for establishing a predetermined electrical parameter; and whereby

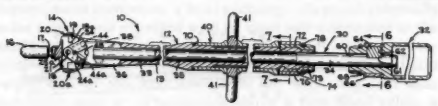
f. sensor means located external to the human body is responsive to said predetermined electrical parameter for providing data indicative of said body fluid pressure.

3,943,916

SURGICAL INSTRUMENT FOR CONIZATION OF THE CERVIX

Leslie Vadas, 135 Riviera Drive, Los Gatos, Calif. 95030

Continuation of Ser. No. 424,410, Dec. 13, 1973, abandoned.
This application Dec. 26, 1974, Ser. No. 536,345
Int. Cl.² A61B 10/00
U.S. Cl. 128—2 B 9 Claims



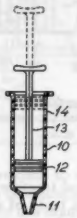
1. An instrument for conization of the cervix of the type comprising an elogate body having a cervical body tip, a diametrical slot in said body behind said tip, opposed extendable and retractable knives pivotally mounted on said body within said slot, actuator means slidable within said body for advancing and retracting said knives, and a grip within which said body rotates; the improvement wherein said knives have radial mounting arms with radial cam follower means, said actuator means comprising a single rod keyed to and slidable along the axis of said body, a handle on the proximal end of said rod, and two cams on said actuator means disposed entirely within said body slot each cam making positive camming engagement with the cam follower means on one of said knife arms for pivoting said knives in both directions, said knives having rounded ends with side cutting edges for making continuous helical incisions as the body and knives are rotated and the knives are progressively advanced during said rotation by means of said rod.

3,943,917

METHOD FOR COLLECTING BLOOD SAMPLES

Ebbe Johansen, Birkerod, Denmark, assignor to Radiometer A/S, Denmark

Continuation of Ser. No. 412,566, Nov. 5, 1973, abandoned.
This application May 12, 1975, Ser. No. 576,676
Claims priority, application Denmark, Nov. 6, 1972, 5492/72
Int. Cl.² A61B 5/00
U.S. Cl. 128—2 F 2 Claims



1. A method of collecting a blood sample for analyzing it, comprising;

providing a syringe chamber with a first end normally communicating with the atmosphere and with a hollow needle communicating with and extending from an opposite end of the chamber to a free end of the needle;

puncturing a blood vessel of a patient with the free end of the hollow needle;

thereupon holding the syringe chamber immobile relative to the patient to quiescently pass a stream of blood from the punctured blood vessel through the hollow needle, by body pressure of the patient into the chamber, until a blood sample of predetermined volume has been collected in the chamber;

then withdrawing the free end of the hollow needle from the blood vessel and terminating said holding of the syringe chamber; and

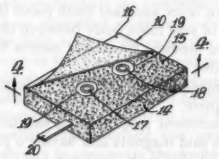
thereafter interrupting the communication of the first end of the syringe chamber with the atmosphere and reducing the volume of the chamber to forcibly expel blood therefrom for analyzing the blood.

3,943,918

DISPOSABLE PHYSIOLOGICAL TELEMETRIC DEVICE

Ronald A. Lewis, Buffalo Grove, Ill., assignor to Tel-Pac, Inc., Rochester, Minn.

Filed Dec. 2, 1971, Ser. No. 204,063
Int. Cl.² A61B 5/04
U.S. Cl. 128—2.1 A 19 Claims



1. A throwaway, one-time use physiological signal sensing and telemetric transmitting device comprising: a mounting element; electrodes carried by said mounting element; adhesive means carried by said mounting element for causing a substantially one-time adherence of the mounting element to the skin of a patent with the electrodes in electrical-signal-

receiving contact with said patient; a wireless transmitter carried by said mounting element connected to said electrodes for transmitting a signal corresponding to physiological information picked up by said electrodes; battery means carried by said mounting element for self-powered operating of said device; and means carried by the device for maintaining the device inoperative prior to a desired use and irreversibly manually operable to cause the transmitter to be placed in a one-time energized operative condition, the elements of the device being miniaturized to provide a low cost construction suitable economically to permit disposal of the device upon completion of a one-time use thereof.

3,943,919

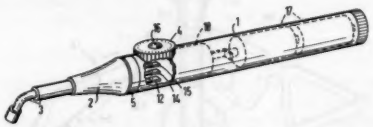
ELECTRICAL TOOTH PULP TESTER HAVING TILTABLE HEAD

Hermann Landgraf, Bensheim, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 13, 1972, Ser. No. 233,672

Int. Cl.² A61B *19/00*; G01R *31/02*

U.S. Cl. 128—2.1 R **7 Claims**



1. Electrical pulp tester, comprising a handpiece, a testing head extending from one end of the handpiece and having a probe, adapted to be applied to a patient's tooth for testing its pulp, spring means connecting said handpiece with said testing head for a tiltable movement relatively to said handpiece and for a shiftable movement axially to the handpiece, a source of power within said handpiece for providing current supplied to the probe, switching means connecting said source of power with said probe for supplying and interrupting the supply of the current to said probe, said switching means having contact members arranged upon said testing head and other contact members arranged on said handpiece and adapted to close when said testing head is tilted or shifted.

3,943,920

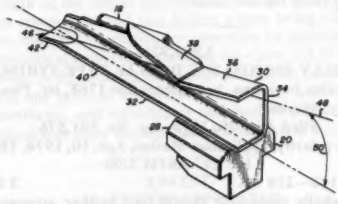
LARYNGOSCOPE BLADE

Ronald E. Kandel, Cupertino, Calif., assignor to Ronald E. Kandel, Cupertino, Calif.

Filed Dec. 6, 1974, Ser. No. 530,181

Int. Cl. A61b *1/26, 1/06, 1/24*

U.S. Cl. 128—11 **12 Claims**



1. A laryngoscope blade comprising an upper wall, a lower wall, and a side wall joining said upper and lower walls; said upper wall including an upper lip engaging portion and an upper gum engaging portion contiguous with one another; said lower wall including a tip portion disposed for engaging and lifting the epiglottis; said upper lip engaging portion overlying and extending at an acute angle with respect to a major extent of said lower wall and said upper gum portion overlying and being substantially parallel to a major extent of said lower wall; said acute angle being dimensioned such that a direct line of sight exists from one end of said walls along an inner surface of the juncture between said upper lip portion and said upper gum portion to an inner surface of said tip portion.

3,943,921

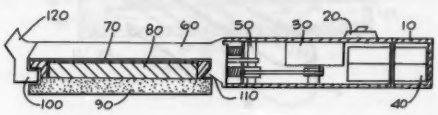
VIBRATOR BATH AND CLEANER

Carl F. G. Colk, Duncan, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Mar. 11, 1975, Ser. No. 557,278

Int. Cl.² A61H *7/00, 9/00*

U.S. Cl. 128—62 R **1 Claim**



1. A vibrator bath and cleaner, comprising:
a case,
a battery mounted in the case,
a switch mounted on the case, electrically connected to the battery,
a motor mounted in the case, electrically connected to the switch,
a vibrator mechanism mounted in the case, driven by the motor,
a front section attached to the case and vibrated by the vibrator mechanism,
the front of the front section forming a scratcher,
retaining means formed in the front section to hold a holder, and
the holder comprising a retainer for a bar of soap and a sponge mounted on the face of the holder.

3,943,922

DRYING APPLIANCE FOR PREVENTING ATHLETE'S FOOT

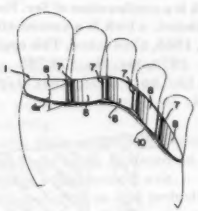
Daihachiro Umeda, c/o Suzuki,No. 2-22-5, Fukugawa, Koto, Tokyo, Japan

Filed Dec. 30, 1974, Ser. No. 537,144

Claims priority, application Japan, Sept. 20, 1974, 49-112633

Int. Cl.² A61F *5/00*

U.S. Cl. 128—81 R **4 Claims**



1. A disposable drying appliance for the toes of a foot for use to prevent athlete's foot, comprising a base member of stiff material which is permanently curved and bent to a general arc shape corresponding to the root of the toes and is adapted to be applied to the underside of the toes, said base member having upstanding flexible convex portions adapted to fit between the toes and defining adjacent concave portions adapted to receive the toes whereby the appliance is well-fitted to the underside of the toes, said base member and convex

portions being constituted of a hygroscopic material capable of absorbing moisture.

3,943,923

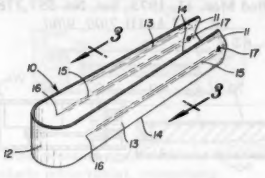
SPLINT AND METHOD OF APPLYING SAME

Samuel Scheinberg, Lincoln City, Oreg., assignor to Lawrence A. Atler, Denver, Colo., a part interest

Continuation-in-part of Ser. No. 261,059, June 8, 1972, abandoned. This application Oct. 10, 1974, Ser. No. 513,857

Int. Cl.² A61F *5/04*

U.S. Cl. 128—89 R **5 Claims**



1. A splint for use on a body extremity comprising

a. An elongated rectangular flat strip of malleable and foldable metal having a width sufficient to substantially embrace the major width of the extremity and of a thickness insufficient to provide requisite rigidity for a splint,

b. a transverse bend formed in the strip which shapes the strip into two legs connected by a curved portion, and

c. a longitudinally extending rigidity-providing bend located generally midway between the longitudinal edges of the legs and extending from the ends of the legs to near the opposite sides of the transverse bend, the leg material at opposite sides of the longitudinal bend being U-shaped and extending at an obtuse angle, said longitudinally bent legs having non-uniform cross sections which permit circulation of air between the splint surfaces and skin of the splinted extremity, and said longitudinally bent legs having splint-serving rigidity at and adjacent to said longitudinal bend.

3,943,924

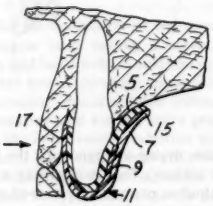
MOUTHPIECE

Steven B. Kallestad, Minneapolis, and Robert H. May, Wayzata, both of Minn., assignors to Northstar Athletic Industries, Inc., Minneapolis, Minn.

Continuation of Ser. No. 432,582, Jan. 11, 1974, abandoned, which is a continuation of Ser. No. 346,852, April 2, 1973, abandoned, which is a continuation of Ser. No. 200,250, Nov. 18, 1971, abandoned, which is a continuation of Ser. No. 755,185, Aug. 26, 1968, abandoned. This application Sept. 30, 1974, Ser. No. 510,788

Int. Cl.² A61F *5/58*; A61C *11/00*

U.S. Cl. 128—136 **12 Claims**



1. A protective mouthpiece comprising:

a. an elongated shell of flexible, shock absorbing polymeric material having an essentially U-shaped cross section defined by inner and outer upstanding portions and a connecting portion, the shell being arcuately formed over its length to fit over a row of teeth, said outer and inner upstanding portions and said connecting portion adapted to respectively overlie the outer, inner and biting surfaces of a user's teeth;

b. and an insert plate member of rigid, force transmitting material disposed in the inner upstanding portion only and completely embedded in a central position of the arcuate length thereof to lie adjacent said inner tooth surfaces when the mouthpiece is placed in the user's mouth.

3,943,925

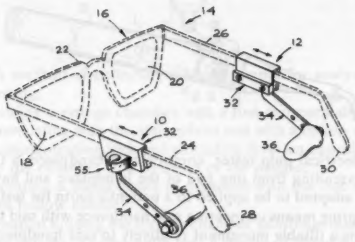
EAR PROTECTOR ASSEMBLY

Howard S. Leight, 16027 Northfield St., Pacific Palisades, Calif. 90272

Continuation-in-part of Ser. No. 346,746, April 2, 1973, Pat. No. 3,856,007. This application Sept. 12, 1974, Ser. No. 505,356

Int. Cl.² A61F *11/00*

U.S. Cl. 128—152 **10 Claims**



9. Ear protection apparatus for use on an eyeglass having a frame with a pair of lens openings containing lenses and a pair of temple bars, comprising:

a pair of mounts having slot means receiving the temple bars of an eyeglass, whereby the mounts can be located at a range of positions along the temple bars;

a pair of earplug holders, each having a forward end pivotally mounted on a corresponding one of said mounts and a rearward end; and

a pair of earplugs, each mounted on the rearward end of a corresponding earplug holder;

each mount including a socket and each earplug holder including a ball at its forward end which is received in said socket, whereby to permit the holder to be pivoted up and down so it can lie opposite the ear canal, as well as toward and away from the ear to move against and away from the ear canal.

3,943,926

WHOLLY DISPOSABLE DENTAL TYPE SYRINGE

Oscar Arvizu Barragan, Insurgentes Sur 1768, ler. Piso, Mexico City, Mexico

Filed Aug. 29, 1974, Ser. No. 501,576

Claims priority, application Mexico, Apr. 10, 1974, 150546

Int. Cl.² A61M *5/00*

U.S. Cl. 128—218 DA **2 Claims**

1. A wholly disposable dental type syringe arranged in a packaged-for-sale form and rearrangeable to its disposition for operation, comprising in combination:

a hollow transparent cylindrical body capable of encasing a dental anesthetic cartridge and formed at its interior with ribs extending substantially the entire length of the hollow interior of the cylindrical body to prevent said cartridge from being removed therefrom, which hollow cylindrical body has one end open and the other end closed and is formed integrally with ears at said open end;

an injection needle which has two points at its opposite ends and is mounted in the closed end of said cylindrical body with one of said points projecting into the interior of said cylindrical body so that when the dental anesthetic cartridge is encased in the interior of the cylindrical body, the projecting point is introduced into said cartridge to contact the dental anesthetic;

a hollow piston removably attached to the closed end of the hollow cylindrical body, which hollow piston has one end open and the other end closed and is formed at its open end with curved arms forming an open ring having a clearance between the free ends of the arms substantially equal to the outside diameter of said cylindrical body, the free ends of the curved arms being slightly concave to embrace said cylindrical body;

a harpoon-like device mounted in the closed end of said hollow piston and projecting therefrom; and

protecting means removably attached to said hollow piston and covering said harpoon-like device, said protecting means comprising a frustoconical component of annual

cross-section, the internal diameter of the smaller end of said component being slightly less than the external diameter of said hollow piston and the external diameter of said smaller end being less than the diameter of the open end of said cylindrical body, the external diameter of the larger end of said component being greater than the external diameter of said open end of the hollow cylindrical body, and the conicity of said frustoconical component being such that said component can be inserted into said open end of the hollow cylindrical body by a distance that is at least equal to the difference between the length of the interior of the hollow cylindrical body and the length of the dental anesthetic cartridge, said frustoconical component and said hollow piston being rearrangeable into said disposition for operation by introducing said frustonical component through the open end of the cylindrical body encasing the dental anesthetic cartridge until said one point of the needle is in contact with the dental anesthetic, and introducing said hollow piston into said cylindrical body through said frustoconical component.

3,943,927

INJECTION APPARATUS

Robert S. Norgren, 2840 N.W. 144th, Beaverton, Oreg. 97005

Filed Mar. 3, 1975, Ser. No. 554,686

Int. Cl.² A61M 5/00

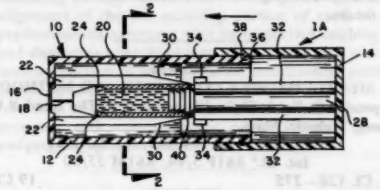
U.S. Cl. 128—218 D **8 Claims**

1. An injection apparatus for injection of a medication from an ampule and into a person's body comprising:

a housing including an ampule-receiving section and an operating section, an ampule having a piston therein and a needle thereon disposed in said ampule- receiving section, said operating section being movable relative to said ampule-receiving section;

guide means provided by said ampule-receiving section along which said ampule is disposed;

ampule-driving means and plunger means provided by said operating section, said ampule-driving means driving a ampule along said guide means to a first position in said housing when said operating section is moved relative to said ampule-receiving section upon said housing being



positioned against an area of the person's body thereby driving a needle through an end of said housing and into the person's body and said plunger means driving said piston in a ampule to a second position thereby injecting the medicine in the ampule into the person's body; and means provided by said ampule-driving means and said guide means to move said ampule-driving means out of engagement with said ampule when said ampule has reached said first position.

3,943,928

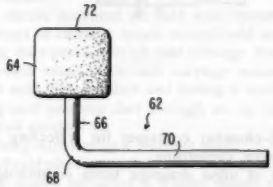
ELIMINATING THE SAFETY HAZARD IN ORAL DISSOLUTION OF A SOLID

Anthony H. Lariccia, 4675 Village St., Erie, Pa. 16506, and Mary L. Lariccia, 1596 W. 30 St., Erie, Pa. 16508

Filed Sept. 25, 1974, Ser. No. 509,215

Int. Cl.² A61M 35/00

U.S. Cl. 128—260 **13 Claims**



1. Structure for safely administering a medication orally providing for retention of the medication in the oral cavity for dissolution while preventing inadvertent swallowing prior to dissolution, comprising

an orally soluable body comprising a medication,

such medicated body being mounted on an elongated rod means including a longitudinal axis,

such rod means including an end embedded in such medicated body and a longitudinally extended non-embedded portion,

the end embedded in such medicated body including retention means for mechanically retaining such medicated body on the rod means, and

means for preventing swallowing during use by humans of the structure comprising

elongated handle means having a longitudinal axis in transverse relationship to the longitudinal axis of the rod means, such handle means being integral with the longitudinally extended non-embedded portion of the rod means, and being predeterminedly spaced longitudinally

from the medicated body along the non-embedded portion of the rod means with the transverse relationship of the elongated handle means defining an included angle between the longitudinal axis of the rod means and the longitudinal axis of the elongated handle means, such included angle being of a value in the range of 60° to 120°,

such elongated handle means having a length greater than the largest opening of the oral cavity to prevent inadvertent swallowing of the medicated body and the rod means.

3,943,929

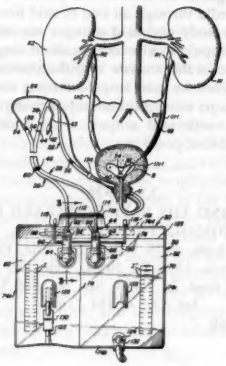
MULTI-CHAMBER CONTAINER AND METHOD

Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Walpole, Mass.

Filed Nov. 15, 1974, Ser. No. 524,022

Int. Cl.² A61F 5/44; A61M 25/00

U.S. Cl. 128—275 **19 Claims**



1. A multi-chamber container for collecting urine from different sources, comprising:

a plurality of urine drainage tubes communicating with separate urine sources;

a receptacle having a plurality of separate urine collection compartments; and

means for separately connecting each of said drainage tubes to one of said separate compartments for simultaneous passage of urine from the drainage tubes to the compartments and retention therein, said connecting means comprising a plurality of drip chambers connecting each of said drainage tubes to a separate compartment to prevent retrograde bacterial movement from said compartments.

3,943,930

DISPOSABLE DIAPER

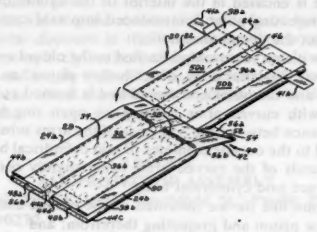
Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 3, 1974, Ser. No. 511,848

Int. Cl.² A61F 13/16

U.S. Cl. 128—287 **23 Claims**

23. A disposable diaper comprising, an absorbent pad assembly having front and back waistline portions, a fluid impervious backing sheet, a crotch region intermediate the waistline portions, and securing means for retaining spaced areas of said backing sheet in a close relationship to define pocket means of said backing sheet in the crotch region depending from the



pad assembly in the crotch region to receive body exudate from an infant.

3,943,931

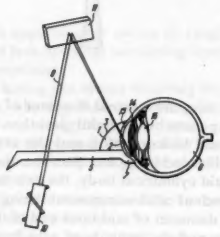
GONIOLENS

Mikhail Mikhailovich Krasnov, ulitsa Veshina, 30, kv. 12, Moscow, U.S.S.R.

Continuation of Ser. No. 427,130, Dec. 21, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,872

Int. Cl.² A61B 17/36

U.S. Cl. 128—303.1 **1 Claim**



1. A convex-concave contact lens with converging optical surfaces for use in laser microsurgery of the eye, said lens having a concave surface of a curvature radius to ensure complete contact thereof with the cornea of the eye and a truncated convex surface of a curvature radius equal to 8.5 mm, the angle confined by the planes of the concave and convex surfaces ranging from 20° to 60°, whereby it is possible to focus a laser beam through said lens in the corner of the anterior segment of the eye during laser goniopuncture.

3,943,932

ACUPUNCTURE NEEDLES AND HOLDER

Yen Kong Woo, 1545 Geary St., Apt. 1, San Francisco, Calif. 94115

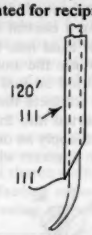
Filed Jan. 17, 1975, Ser. No. 541,933

Int. Cl.² A61B 17/40, 17/34

U.S. Cl. 128—303.18 **8 Claims**

1. Acupuncture needles and holder comprising an outer tubular shield having a central passage therein of uniform cross-section coextensive with its length, a chamfered tip on

the terminal end of said shield, and an inner elongated acupuncture needle mounted for reciprocation within said central



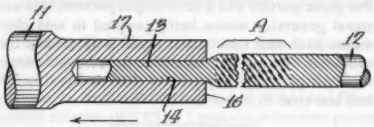
passage for movement relative to said outer tubular shield beyond said chamfered tip thereof.

3,943,933

SUTURE WITH RADIATION DEGRADATION NEAR NEEDLE-SUTURE JUNCTION

Arthur A. Gertzman, Somerville, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Sept. 25, 1974, Ser. No. 508,928
Int. Cl.² A61B 17/06
U.S. Cl. 128—339 **16 Claims**



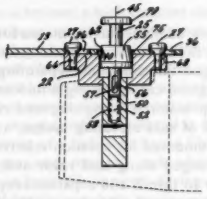
1. A needle-suture combination comprising a needle having a sharp end and a blunt end and having a recess at said blunt end, and a suture made of a material selected from the group consisting of cellulose and cellulose esters, polyolefins, vinyl polymers, acrylic polymers and homopolymers and copolymers of lactide and glycolide, said suture having one tip positioned within said recess, means retaining said tip of said suture within said recess to attach said suture to said needle, and a radiation-weakened segment in said suture adjacent the location of its attachment to said needle and exterior of said recess, said weakened segment having a breaking strength of from about 3 to 26 ounces, whereby said needle can readily be separated from said suture by applying a pulling force to said needle to break said weakened segment.

3,943,934

QUICK RELEASE MECHANISM FOR SURGICAL DEVICES

John H. Bent, Carpinteria, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 30, 1974, Ser. No. 510,222
Int. Cl.² A61B 17/14
U.S. Cl. 128—317 **18 Claims**



1. A medical instrument adapted to be moved by a power source and intended for quick release therefrom comprising a mounting portion for retention in driving relation with a power source,

said mounting portion including a predetermined number of apertures generally radially disposed with respect to a predetermined reference center point,

each aperture including a pin receiving portion and a latching portion, and

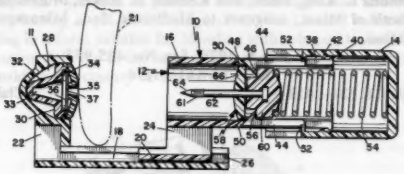
a locking pin aperture eccentrically located with respect to said predetermined reference center point whereby upon mounting of said instrument on the power source by alignment of the pin receiving portion of each of said predetermined apertures with its respective latching pin and displacing same to engage said latching pins with the latching portion of said apertures, said latching portions of said apertures are radially disposed with respect to said reference center point and said locking pin aperture is eccentric with said reference center point to permit wedging engagement thereof by a locking pin.

3,943,935

DISPOSABLE EARLOBE PIERCING APPARATUS

Robert C. Cameron, 301 Hilltop Drive, Chula Vista, Calif. 92010

Filed Sept. 7, 1973, Ser. No. 395,016
Int. Cl.² A61B 17/00
U.S. Cl. 128—330 **9 Claims**



1. An apparatus for piercing of an earlobe to create and sustain an opening for the attachment of earrings, including a spring propelled piercing dart, and wherein the improvement comprises:

an anvil means,

carriage means mounted on said anvil means for guided movement of carriage means toward said anvil means,

a piercing dart positioned on said carriage means,

spring means retained on said carriage means positioned against said piercing dart and having a resilient bias for driving said piercing dart through an ear lobe and into said anvil means,

said piercing dart having a piercing shaft,

the axis of said piercing shaft intersecting said anvil means,

and latch means including a trigger means responsive to engagement pressure of said carriage means against an ear lobe for releasing said piercing dart from said carriage means.

3,943,936

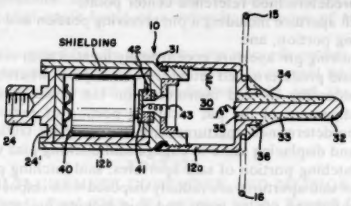
SELF POWERED PACERS AND STIMULATORS

Ned S. Rasor, Kettering, and Joseph William Spickler, Maumee, both of Ohio, assignors to Rasor Associates, Inc., Sunnyvale, Calif.

Division of Ser. No. 73,809, Sept. 21, 1970, Pat. No. 3,835,864. This application Oct. 9, 1973, Ser. No. 404,764
Int. Cl.² A61N 1/36
U.S. Cl. 128—419 P **14 Claims**

1. A stimulator device for insertion in a living body, and capable of insertion in the heart, comprising a capsule having a generally cylindrical body portion including a positive pulsing electrode at its exterior surface, said body portion having in connection therewith means defining a negative pulsing stimulating electrode which is insulated from said positive electrode and has a surface portion exposed to form a leading end portion of the exterior surface of said capsule as it is applied to a body by transvenous or transarterial insertion,

pulsing means connected to said electrodes having in immediate connection therewith a power source and means for activation thereof, and said capsule forming a housing containing the total of said pulsing means, power source and activating



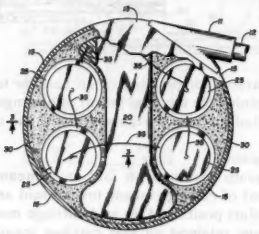
means to form threwith an integral unit having a fully contained power source and conditioned thereby to function free of outside leads or wires on placement thereof in a body by transvenous or transarterial insertion.

3,943,937

GAS ABSORBING IMPLANTABLE ELECTRICAL MEDICAL DEVICE

Wendell L. King, Isanti, and Kenneth B. Stokes, Minneapolis, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed July 5, 1974, Ser. No. 485,952
Int. Cl.² A61N 1/36
U.S. Cl. 128—419 P **5 Claims**



1. An implantable electrically operated medical device comprising, at least one electrochemical generating cell, an electrically powered actuating device connected to the cell and energized therefrom, a mounting member being formed of a plastic material having good permeability to hydrogen relative to epoxy resin and having recesses therein mounting said cell and said device in said recesses, a covering of epoxy resin material positioned over and encapsulating said mounting member with the cell and device therein, and means including said mounting member providing a space for absorption and storage of hydrogen gas from said cell, said epoxy resin being biocompatable with and impervious to body fluids and bonding well with the plastic material of the mounting member.

3,943,938

ANAL SPHINCTER DEVICE AND BARIUM ENEMA PLUG

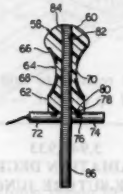
Paul Wexler, 110-45 Queens Blvd., New York, N.Y. 11375, and Boguslav H. Fischer, 251 E. 32nd St., New York, N.Y. 10016

Filed Feb. 27, 1974, Ser. No. 446,280
Int. Cl.² A61N 1/36
U.S. Cl. 128—421 **13 Claims**

1. An apparatus for stimulating the anal sphincter to maintain it in a continuously substantially contracted condition while a fluid is being introduced into the rectum, said apparatus comprising:

a. plug means for insertion into the anus such that a portion of said plug means is surrounded by the anal sphincter, said plug means having a central aperture therethrough for the introduction of fluid into the rectum when said plug means is inserted into the anus;

b. electrode means mounted on said plug means such that said electrode means contacts the anal sphincter when said plug means is inserted into the anus, said electrode means being adapted to apply an output signal to the anal sphincter to cause it to contract when fluid is introduced



into the rectum through said central aperture in said plug means, said output signal being derived from an external signal generator means; and

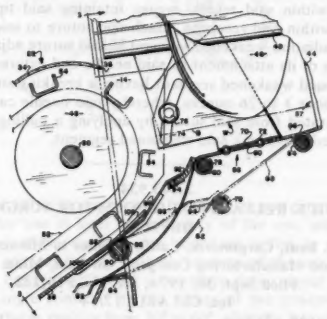
c. said external signal generator means generating a biphasic output signal having a positive pulse portion, a negative pulse portion and a zero output portion, said external signal generator means being coupled to said electrode means such that said output signal is applied to the anal sphincter through said electrode means, said output signal having a frequency greater than or equal to 300 Hz. and less than or equal to 1000 Hz.

3,943,939

COMBINE WITH ADJUSTABLE FEED PLATE

Edward W. Rowland-Hill, Lancaster, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 25, 1975, Ser. No. 561,955
Int. Cl.² A01F 7/06
U.S. Cl. 130—27 T **12 Claims**



1. In an axial flow combine having means for elevating crop material from the field to a terminal end there of and at least one axially arranged threshing and separating unit, said unit including an elongated casing having a forward inlet opening for receiving crop material being disposed rearwardly from said terminal end of said elevating means, a rotor arranged coaxial with and mounted for rotation relative to said casing and elements arranged along said rotor and said casing for coaction together to thresh and separate crop material upon rotation of said rotor, said rotor having feeding means on a forward end thereof adjacent said casing inlet opening and being operable for feeding crop material to said casing inlet opening and said rotor end upon rotation of said rotor, the

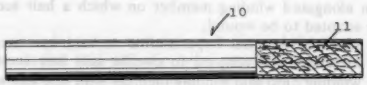
improvement which comprises: feed ramp means being spaced below said feeding means and together therewith defining a passageway for crop material from said terminal end of said elevating means to said casing inlet opening, said ramp means defining the lower boundary of said passageway and being adapted to guide crop material from said elevating means through said passageway upon operation of said feeding means; and means for adjusting said ramp means toward and away from said feeding means to vary the cross-sectional size of said passageway in accordance with the nature and bulk of said crop material and thereby effect efficient feeding of said crop material by said feeding means from said eevating means to said casing inlet opening and said rotor end.

3,943,940

METHOD OF REMOVING NICOTINE IN SMOKING AND A SMOKING FILTER TO BE USED THEREFOR

Isao Minami, No. 10-3, Aza-kashikiri, Nakamura, Kitajima, Itano, Tokushima, Japan

Filed Sept. 13, 1974, Ser. No. 506,192
Int. Cl.² A24B *15/02, 15/027, 15/04*
U.S. Cl. 131—10.1 6 Claims



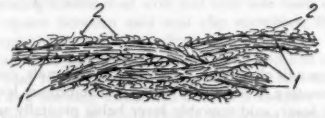
1. A smoking filter which comprises a filter body and a cigar or cigarette attached thereto which filter is flexible to such an extent that it may deform when pressed by hand, and a capsule being able to be broken when pressed by hand, and filled with an aqueous solution of 0.05 to 1 percent potassium permanganate and chlorine in an amount of 0.05 to 100 ppm, so that when the capsule is broken prior to smoking, the potassium permanganate solution permeates through the filter wherein it is subsequently able to oxidize nicotine contained in smoke passing through said filter.

3,943,941

SYNTHETIC SMOKING PRODUCT

Dennis Boyd, Belfast, Northern Ireland, and George Porter, London, England, assignors to Gallaher Limited, Belfast, Northern Ireland

Filed Apr. 18, 1973, Ser. No. 352,238
Claims priority, application United Kingdom, Apr. 20, 1972, 18315/72
Int. Cl.² A24B *15/00;* A24D *1/18*
U.S. Cl. 131—2 3 Claims



1. A tobacco substitute which consists essentially of a complete fuel and at least one volatile substance impregnating said fuel, said volatile substance being capable of distilling or subliming without chemical change, and said fuel consisting essentially of combustible, flexible and self coherent fibres made of a carbonaceous material containing at least 80 percent carbon by weight, which material is the product of the controlled pyrolysis of a cellulose based fibre containing only carbon, hydrogen and oxygen, and which has suffered a weight loss of at least 60 percent during the pyrolysis, the fibres produced in the pyrolysis having a cross-sectional dimension between 5 and 50 microns, and a length between 1 mm and 5 cm, and being agglomerated into a plurality of strands, which strands have a cross-sectional dimension between 0.1 mm and 5 mm and a length of between 5 mm and 5 cm.

3,943,942

SMOKING MIXTURES

Robert Craig Anderson, and Alan James Herd, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 21, 1974, Ser. No. 482,026
Claims priority, application United Kingdom, July 9, 1973, 32503/73
Int. Cl.² A24B *3/14, 13/00, 15/08*
U.S. Cl. 131—17 R 10 Claims

1. A thermally degraded carbohydrate tobacco substitute made by subjecting a carbohydrate to a catalyzed thermal degradation at a temperature above 100°C until the weight of the degraded carbohydrate is less than 90 percent of the weight of the original carbohydrate, said substitute containing sufficient sodium carbonate such that slurrying the substitute with water yields a 15 percent solution/suspension and a liquor having a pH in the range of 8.5 to 13, said substitute being in a form suitable for blending with tobacco to increase nicotine delivery in the smoke from the tobacco where this is considered necessary or desirable.

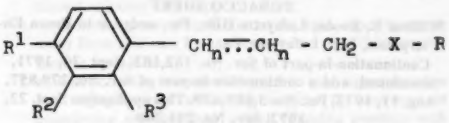
3,943,943

CINNAMIC DERIVATIVES AS TOBACCO ADDITIVES

William F. Cartwright, Manchester, Conn.; Richard E. Means, and Andrew G. Kallianos, both of Durham, N.C., assignors to Liggett & Myers Incorporated, Durham, N.C.

Filed July 9, 1974, Ser. No. 486,841
Int. Cl.² A24B *3/14, 13/00, 15/08*
U.S. Cl. 131—17 R 21 Claims

1. The method of improving the flavor and aroma of tobacco and tobacco smoke which comprmises adding to tobacco a flavor and aroma improving amount of a cinnamic derivative of the formula:

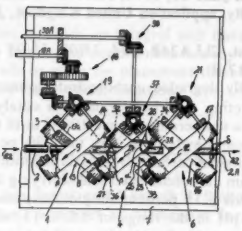


wherein X is oxygen; *n* is 1 or 2; the dotted line signifies the optional presence of an olefinic double bond depending upon the value of *n*; R is, lower alkyl; each of R^1, R^2, and R^3, when taken separately, is hydrogen, lower alkyl, hydroxy, lower alkoxy or lower acyl and R^1 R^3, when taken together, form a divalent radical which forms a fused ring of from 5 to 6 ring members.

3,943,944
APPARATUS FOR MAKING AND SEPARATING WRAPPED CIGAR BUNCHES

Helmut Stoffers, Geesthacht; Rudolf George; Helmut Niemann, both of Hamburg, and Willy Rudszinat, Dassendorf, all of Germany, assignors to Hauni-Werke Korber & Co. KG, Hamburg, Germany

Filed Dec. 12, 1973, Ser. No. 426,627
Claims priority, application Germany, Dec. 19, 1972, 2262064
Int. Cl.² A24C 1/36
U.S. Cl. 131—59 11 Claims



1. Apparatus for converting a file of aligned rod-shaped tobacco fillers and a continuous adhesive-coated web into discrete wrapped fillers, comprising first conveyor means for moving said file of aligned fillers lengthwise along a predetermined path at a first speed and for simultaneously rotating said fillers about their axes; means for feeding said web lengthwise and obliquely toward said path so that the web is convoluted around successive fillers and forms a tube which moves lengthwise, rotates about its axis, and consists of partially overlapping helices; means for reducing the tensile strength of longitudinally spaced annular portions of said tube intermediate successive fillers while the tube moves lengthwise and rotates about its axis, comprising means for circumferentially perforating said tube, said annular portions of reduced tensile strength continuing to connect the preceding and next-following portions of the tube to each other; and second conveyor means for moving said tube lengthwise along said path at a higher second speed so that said tube breaks at said longitudinally spaced annular portions of reduced tensile strength.

3,943,945
PROCESS FOR PREPARATION OF RECONSTITUTED TOBACCO SHEET

William E. Rosen, Lafayette Hills, Pa., assignor to Rosen Enterprises, Inc., Lafayette, Pa.

Continuation-in-part of Ser. No. 182,183, Sept. 20, 1971, abandoned, and a continuation-in-part of Ser. No. 279,857, Aug. 11, 1972, Pat. No. 3,889,689. This application Sept. 22, 1972, Ser. No. 291,248
Int. Cl.² A24B 1/92, 3/12, 9/00, 15/00
U.S. Cl. 131—140 C 8 Claims

1. In a process of producing reconstituted tobacco sheet including the steps of (1) evenly distributing a plurality of finely divided tobacco particles throughout a spatial zone, and (2) thoroughly mixing said tobacco particles in a liquid solution containing catalase and hydrogen peroxide, (3) allowing said catalase and hydrogen peroxide to react in situ at ambient temperature and pressure in the presence of the tobacco and (4) causing said tobacco to aggregate into a self-supporting sheet.

3,943,946
METHOD AND APPARATUS FOR ISOLATION OF HAIR FROM TREATMENT MATERIALS

Ramon Gallegos, 28819 Leah Circle, Palos Verdes Peninsula, Calif. 90274

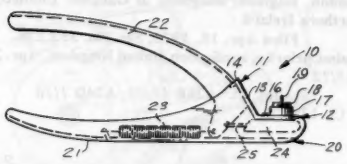
Filed Nov. 21, 1974, Ser. No. 525,733
Int. Cl.² A45D 2/02
U.S. Cl. 132—39 9 Claims

1. An apparatus for isolating sections of hair from hair treatment materials, said apparatus comprising:
- an elongated winding member on which a hair section is adapted to be wound;
- a sheet of material impermeable to said hair treatment materials and adapted to overlie said hair section for winding onto said winding member with said hair section; and
- a sealing member adapted for fitting onto said winding member in overlying relation to the wound up hair section and said sheet and operative to press upon and seal said hair section and said sheet from hair treatment materials.

3,943,947
TOE NAIL CLIPPER FOR DOGS AND OTHER ANIMALS

Samuel T. Voll, 308 S. 52nd St., Great Falls, Mont. 59405

Filed Jan. 9, 1975, Ser. No. 539,861
Int. Cl.² A45D 29/00
U.S. Cl. 132—73 2 Claims

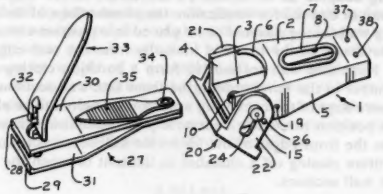


1. A toe nail clipper for dogs and other animals, comprising in combination, a frame consisting of a stationary lever and a movable lever, said movable lever being pivotally supported on said stationary lever, a plastic device being secured upon one end of said stationary lever, said plastic device comprising a flat base integral with a sleeve upon one side of said base, said sleeve having a simple axis which is perpendicular to the plan of said flat base, said sleeve having internal screw thread, a rotatable plug being externally screwthreaded and a gauge within said threaded opening of said sleeve, a handle upon one end of said plug or rotation of said plug within said sleeve, and opposite end of said plug forming a flat face against which an end of an animal toe nail is positioned, a movable cutter being positioned adjacent a flat side of said plastic device base, said movable cutter being attached to said movable lever whereby pivotable movement of said movable lever causes said movable cutter to slide respective to said plastic device base so as to cut said toe nail stopped at its end abainst said plug face.

3,943,948
CASE WITH CLOSEABLE LID

James J. A. Sartore, Albany, N.Y.

Filed July 15, 1974, Ser. No. 488,270
Int. Cl.² A45D 29/00
U.S. Cl. 132—73 16 Claims



1. A case adapted to contain a nail clip and the waste clippings produced, said nail clip being generally comprised of: upper and lower nail clip members fastened at one end forming a bifurcated portion, whose opposite end contains jaws spaced apart and formed in opposing relationship to each other, tied together by means of an operating handle rivet and operating handle, said operating handle rivet being placed through aligned openings located near said jaws, controlling the movement of said jaws through said nail clip members which are fastened at said one end;

wherein the improvement comprises, a generally tubular case portion formed of top, bottom and two side walls in continuous relationship with each other, having front and rear openings running through the longitudinal portion;

inserting a nail clip into said case forms a united combination, held together by internal means or knob like catches with two contiguous relationships resulting, one between the said top case wall which contains: provision to allow for free movement of the operating handle in its front portion, provision for a file placed at the file location and having two operating handle stops mounted on said top wall, to prevent lateral movement when the operating handle is placed between them, said top wall abutting a nail file below and upper nail clip member, a second relationship being formed between the bottom case wall and the lower nail clip member, the said bottom case wall containing a bottom opening to receive the bottom of said operating handle rivet with said case side walls enclosing the space between said nail clip members, forming a receptacle for the waste clippings produced;

said case rear opening allowing the nail clip end to jut out the case rear opening exposing the nail clip end and nail clip end opening which can contain a keeper,

each said side wall containing a shaft, one open and one closed knob mounted thereon;

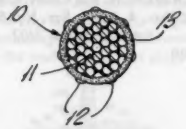
a slotted type double hinged front lid being attached to said shafts and secured by shaft tops restricting the play in the hinges by sandwiching them between said shaft tops through said shafts and said case side walls, said hinges containing hinge openings strategically placed to mate with said open knobs mounted on said case side walls forming catches to hold the front lid open;

said closed knobs being so placed to mate with the rear sections of the said hinge slotted openings forming catches holding the said front lid in the closed position, whereby the internal portion of the said front lid which contains a lid bit will be held in an abutting relationship to seal the said walled portion of said front case opening and nail clip jaws.

3,943,949
FLAVORED DENTAL ARTICLES

William Howard Ashton, Philadelphia, Pa., and Robert Schenke Russell, South River, N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 26, 1974, Ser. No. 527,327
Int. Cl.² A61C 15/00
U.S. Cl. 132—89 7 Claims

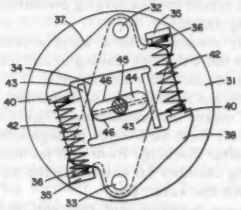


1. A stabilized flavored article for cleaning the teeth comprising a plurality of filaments of a substrate material formed into a larger thread of a sufficiently small diameter to permit insertion between the teeth, said thread impregnated with water-insoluble wax with spray-dried flavor particles adhered to said water-insoluble wax.

3,943,950
CHANGE DISPENSER ANTI-JAM DEVICE

Gerry W. Thur, Oconomowoc, Wis., and Peter H. DeGraff, Ithaca, N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 12, 1975, Ser. No. 549,423
Int. Cl.² G07D 1/00
U.S. Cl. 133—4 A 22 Claims



1. A change dispensing apparatus, including

a. driving means rotatable in a first direction around an axis;

b. driven means rotatable in said first direction to operate the dispensing apparatus;

c. means for transmitting the rotational movement of said driving means to said driven means to operate the dispensing apparatus including support means secured to said driven means, said support means extending outwardly from said axis;

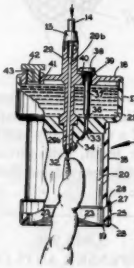
d. a drive member secured to said driving means and positioned adjacent said support means;

e. a connecting member mounted on said support means away from said axis for movement in a direction perpendicular to said axis;

f. and an actuating member secured to said support means and engaging said connecting member for moving said connecting member into a first engaging position with said drive member to provide a first rotational force on said connecting member which will allow the actuating member to transmit the rotational movement of said drive member to said support means, said drive member moving said connecting member to a second engaging position on said drive member against the action of said actuating member upon the stopping of said support means, said connecting member forming an angle with said drive member upon further movement of said drive member wherein said actuating member will provide a second rotational force on said connecting member

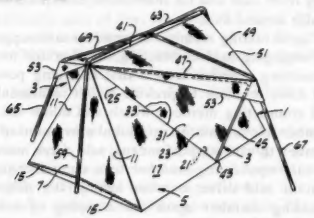
which is greater than and opposite to said first rotational force whereby said connecting member and said support means will be rotated in a direction reverse to the first direction of said driven means to return the connecting member to said first engaging position.

3,943,951
WATER JET CLEANING APPLIANCE
Donald R. Spotz, 6261 S. W. 5th Court, Plantation, Fla. 33304
Filed Nov. 4, 1974, Ser. No. 520,562
Int. Cl.² B08B 3/02
U.S. Cl. 134—100 **7 Claims**



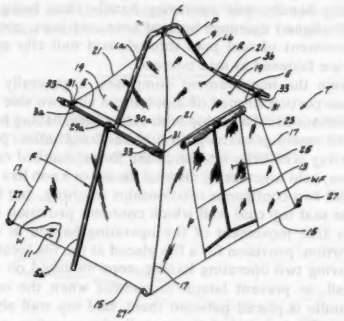
1. A personal cleaning appliance for using pressurized water to clean the extremities of a person's hand or foot comprising:
a receptacle defining a cleaning chamber for receiving the extremity to be cleaned;
means on said receptacle at one end of said cleaning chamber for the insertion of the extremity to be cleaned;
jet nozzle means for discharging pressurized water into said cleaning chamber;
means for connection to a water source having a water passage there through leading to said jet nozzle means for passing pressurized water thereto;
passage means leading into said chamber adjacent said jet nozzle means for conducting a liquid cleaning solution separately from said water passage onto the pressurized water after discharge from said jet nozzle means in said cleaning chamber for entraining the liquid cleaning solution with the water; and
valve means between said reservoir and said jet nozzle means for controlling the flow of cleaning solution from said reservoir to said jet nozzle means;
said valve means being cooperable with said passage means for selectively opening and closing the same.

3,943,952
TENT
Tom Eugene Marquart, Leslie, and Robert Roger Cantwell, New Haven, both of Mo., assignors to Kellwood Company, St. Louis, Mo.
Filed Feb. 19, 1975, Ser. No. 551,060
Int. Cl.² A45F 1/00, 1/10
U.S. Cl. 135—1 R **7 Claims**



1. A tent having two opposite side walls and a pair of wings, one extending laterally outwardly from one side wall and the other extending laterally outwardly from the other side wall, each side wall comprising a front section and a rear section with a wing opening therebetween, each wing comprising a front wall joined to the rear edge of the front section of the respective side wall and a back wall joined to the front edge of the rear section of the respective side wall, each front wing wall comprising an outside screen and an inside closure flap joined to the respective front side wall section at said rear edge thereof, each back wing wall comprising an outside screen and an inside closure flap joined to the respective rear side wall section at said front edge thereof, each closure flap being adapted to be closed on the inside of the respective screen or opened for ventilation, the closure flaps of the front wing walls being adapted to be placed in a position extending transversely of the tent and inwardly from the rear edges of the front side wall sections to form a partition closing off a chamber in the tent between the front side wall sections, the closure flaps of the back wing walls being adapted to be placed in a position extending transversely of the tent and inwardly from the front edges of the back side wall sections to form a partition closing off a chamber in the tent between the back side wall sections.

3,943,953
UMBRELLA TENT
Robert R. Cantwell, New Haven, and Tom E. Marquart, Leslie, both of Mo., assignors to Kellwood Company, St. Louis, Mo.
Filed Aug. 21, 1974, Ser. No. 499,307
Int. Cl.² A45F 1/04, 1/16
U.S. Cl. 135—3 E **1 Claim**



1. A tent comprising four walls and a peaked roof, the upper edges of the walls constituting eaves which generally form a rectangle when the tent is erect, the lower edges of the walls being adapted to be secured to the ground, and an external frame structure for holding the tent erect with said walls and roof constituting tension members for bracing and for stabilizing the frame, the latter comprising only two eave frame members disposed adjacent to two opposite eaves and extending generally parallel to said two eaves on the outside thereof, only two poles, one for each of said eave frame members, extending up from the ground on the outside of two opposite of said walls for supporting said eave frame members and for holding the tent and only one ridge frame member extending generally centrally over the roof of the tent from one of said eave frame members to the other for holding said peaked roof erect above said eaves, said eave frame members being connected at their ends to said tent adjacent the corners of said rectangle, said ridge frame member being connected generally at its center to the peak of the roof, each pole having a resilient clip at its upper end for connection to its respective eave frame member generally at the center of length of the eave frame member, and said ridge frame member having a resilient clip at each of its ends for connection to said eave frame members generally at the center of length of the latter.

3,943,954

PIPELINE TRANSPORTATION OF VISCOUS HYDROCARBONS

Kenoth H. Flournoy; Ricardo L. Cardenas, and Joseph T. Carlin, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 464,886
Int. Cl.² F17D 1/17; B01F 17/00
U.S. Cl. 137—13 10 Claims

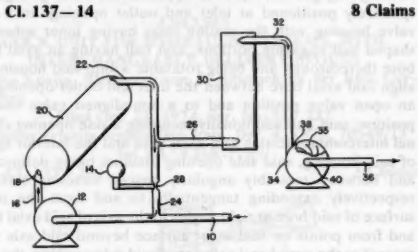
1. In the transportation of viscous hydrocarbons of pipeline, the improvement which comprises forming an oil-in-water emulsion by introducing into the pipeline with said hydrocarbons an aqueous solution of about 0.1 to about 2.0 percent by weight of an anionic surfactant and about 0.05 to about 5.0 percent by weight of a quanidine salt, and wherein the said surfactant is selected from the group consisting of water soluble salts of alkyl sulfates having from 6 to 20 carbon atoms and water soluble salts of unsaturated aliphatic carboxylic monobasic acids having from 6 to 20 carbon atoms.

3,943,955

STABILIZATION OF WASTE MATERIAL

Earl H. Bradley, Seekonk, Mass., assignor to General Signal Corporation, Rochester, N.Y.

Continuation of Ser. No. 383,714, July 30, 1973, abandoned, which is a division of Ser. No. 242,989, April 11, 1972, abandoned. This application Sept. 3, 1974, Ser. No. 502,687
Int. Cl.² F04D 13/16
U.S. Cl. 137—14 8 Claims



5. A method of maintaining pressure in a tank comprising the steps of:

1. supplying a pressurized fluid to an inlet port of a tank;
2. directing said pressurized fluid from an outlet port of said tank into a conduit; and
3. permitting flow through said inlet port, said tank, said outlet port, and a rotatable impeller while simultaneously maintaining pressure in said tank by engaging said rotatable impeller in said conduit in a manner tending to oppose the flow of said fluid from said tank to said conduit.

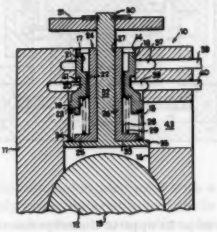
3,943,956

HYDRAULIC GOVERNORS

Richard Hills, Baldock, England, assignor to Borg-Warner Limited, Letchworth, England

Filed June 13, 1973, Ser. No. 369,631
Claims priority, application United Kingdom, July 6, 1972, 31174/72
Int. Cl.² G05D 13/10
U.S. Cl. 137—56 2 Claims

1. An hydraulic governor comprising a member rotatable about an axis, and a valve and weight assembly rotatable about the axis of said member and including a movable regulating valve element slidably disposed in said rotatable member, said rotatable member having a fluid pressure supply port and also a fluid pressure discharge port in communication with said valve element, said valve element being movable outwardly by centrifugal force to establish communication between said ports, said valve element having a part thereof subject to fluid pressure developed in said discharge port and movable in response thereto to cause said valve element to close said supply port, the pressure in said discharge port increasing in three stages in accordance with increasing speed to rotation of said rotatable member, said assembly including first and second weight members, a first spring member between said valve element and said first weight member, a second spring member between said valve element and said second weight member, said first and second spring members assisting centrifugal force on said valve element and said first and second weight members in the first and second stages of pressure rises, first stop means for arresting outward movement of said first weight member at the end of said first stage so that said first



spring member exerts a constant force on said valve element, second stop means for arresting outward movement of said second weight member at the end of said second stage so that said second spring member exerts an additional constant force on said valve element, fluid pressure acting on said valve part of said valve element being effective to counteract the combined constant forces of said spring members and the centrifugal force of said valve member and to alone determine pressure rise in said third stage, said first and second spring members comprise coil springs in telescoping relation surrounding said weight members, and said first spring member is located between said valve element and said first weight member and said second spring member is located between said valve element and said second weight member.

3,943,957

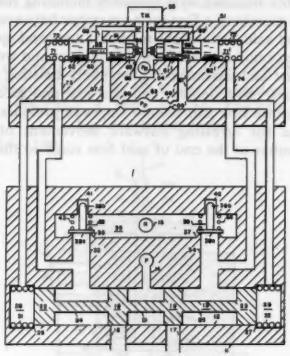
FLOW CONTROL VALVE WITH INTERNAL RATE OF FLOW FEEDBACK

Paul F. Hayner, Gilford, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Mar. 17, 1975, Ser. No. 558,754
Int. Cl.² F15B 13/044
U.S. Cl. 137—85 12 Claims

1. A valve system comprising first and second control conduits, a first stage responsive to an input signal for generating fluid control pressures in said conduits, a second stage comprising a cylinder and piston valve and including a fluid inlet connection, first and second fluid inlet connections, a fluid return connection, and first and second fluid return paths each interconnecting said cylinder and piston valve with said return connection, said cylinder and piston valve being responsive to said control pressures in said conduits for controlling the flow of fluid from said inlet connection to one of said load connections and from the other of said load connections through one of said fluid return paths to said fluid return connection, characterized in that said system includes first and second variable flow sensors interposed in said first and second return paths respectively, said sensors comprising first and second poppet valves each resiliently biased toward a closed position against the urging of the pressure in its associated return path, and first and second feedback passageways providing fluid communication between said first stage and said first and

second return paths respectively at locations upstream of said sensors, said passageways transmitting fluid pressures from



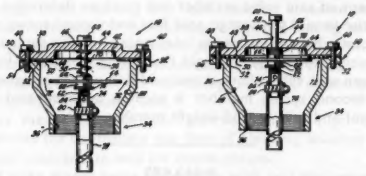
said return path so as to oppose the response of said first stage to said input signal.

3,943,958

CONTINUOUS AIR REMOVAL VALVE

Roy Forrest Davis, Jr., 3946 Lay, East View Apts., Des Moines, Iowa 50317

Filed Oct. 4, 1974, Ser. No. 512,260
Int. Cl.[2] F16K *24/00*
U.S. Cl. 137—217 **6 Claims**



1. An air removal valve assembly for use in a water distribution system of the class having a main flow line for conducting water under pressure, said main line being provided with an outlet and including an upstanding riser pipe, said valve assembly comprising:

a valve housing having a top and bottom end and a through bore and adapted at its bottom end for attachment to the top of a riser pipe for communication with the interior thereof,

a valve cap removably mounted to the top of said housing,

said valve cap having a through opening of lesser diameter than but in registry with the bore in said housing,

a spring loaded valve stem having a valve means on one end,

means axially disposed on said valve cap for supporting said valve stem so that said valve means is disposed within said housing and adapted for yieldable sealing engagement with said through opening,

an elongated conduit being of a smaller outside size than the inside of the riser pipe and having one end within said housing operatively secured to said valve stem below said valve means,

said conduit extending from said housing downwardly through the riser pipe so that its other end projects into said main flow line in the direction of water flow for a selected distance, and

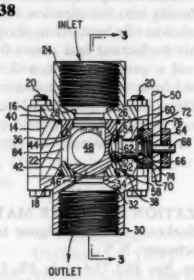
means in said one end of said conduit for providing communication between the interior thereof and the bore in said housing.

3,943,959

TWO-WAY BALL VALVE

W. Dean Kirkland, Walnut Creek, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Sept. 4, 1974, Ser. No. 503,119
Int. Cl.[2] F16K *51/00*
U.S. Cl. 137—238 **8 Claims**



1. A ball adapted for operable seating in liquid sealing floating engagement between opposed ball seating rings respectively positioned at inlet and outlet openings in a ball valve housing with the seating rings having inner spherical shaped ball engaging portions, said ball having an axial flow bore therethrough and being rotatable within said housing to align said axial bore between the inlet and outlet openings in an open valve position and to a non-aligned valve closing position, said ball additionally including a side opening channel intercommunicating said axial bore and the interior space of said housing, said side opening channel being defined by and between rotatably angularly spaced coacting surfaces respectively extending tangentially to and from the inner surface of said bore at right angles to the axis of said axial bore and from points on said inner surface beyond said axis with respect to the peripheral exterior of said side opening, the side and axial bore openings of said ball being peripherally spaced and the remaining areas therebetween providing two peripheral spaced curvilinear bridges on the surface of said ball constituting seating and sealing engaging surfaces for coacting with said seating ring ball engaging portions, and defining portions of the outer peripheries of said axial flow bore and said side opening channel, said channel being operable with the valve in open position to open the interior space in the housing to inlet flow for flushing the space and thereby prevent formation of contaminated dead spaces in the housing.

3,943,960

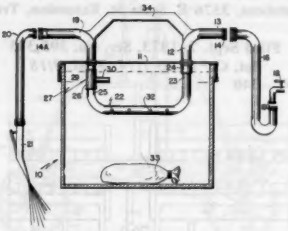
CHEMICAL DISPENSER

Marius H. Syrenne, Saskatoon, Canada, assignor to National Sanitation Services, Ltd., Saskatoon, Canada

Filed Oct. 4, 1973, Ser. No. 403,424
Int. Cl.[2] B01D *33/38, 11/02*; A01C *15/00*
U.S. Cl. 137—268 **2 Claims**

1. A chemical dispenser adapted to be connected with a source of water under pressure and to be used in conjunction with a powdered water soluble chemical in said dispenser; comprising in combination a container, a detachable cover for said container, water inlet and water outlet means connected to said detachable cover, said water inlet means being connectable to said source of water under pressure, an apertured tubular connector below said detachable cover and within said container when said detachable cover is attached to said container, connecting said water inlet means with said water outlet means, said tubular connector being substantially U-shaped and including a main portion lying substantially parallel to said detachable cover and spaced above the base of said

container and being provided with a plurality of relatively small holes through the wall of said main portion, a water outlet branch connected to said water outlet means below said detachable cover and in said container when said detachable cover is attached to said container, said water outlet branch



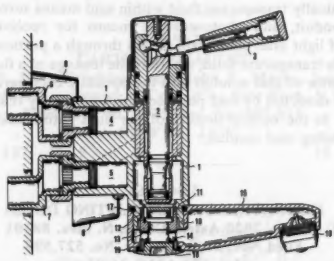
taking the form of a T pipe tubular member connected between said tubular connector and said water outlet means with one leg of said member communicating with the interior of said container above said main portion of said tubular connector and a handle extending between said water inlet and water outlet means exteriorally of said cover.

3,943,961

COCK UNIT FOR HYDRAULIC SYSTEMS, WITH INTERCHANGEABLE DELIVERY SPOUTS

Alfons Knapp, Bleicherstrasse 3, Biberach an der Riss, Germany

Filed Oct. 23, 1974, Ser. No. 517,227
Claims priority, application Italy, Dec. 4, 1973, 70549/73
Int. Cl.² F16K *11/00*
U.S. Cl. 137—269 **3 Claims**



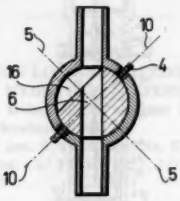
1. A cock unit comprising a body having an inlet and an outlet, the inlet comprising inlet unions for cold and warm water, the outlet comprising an outlet union, the body having a passage therethrough for the flow of water from the inlet unions to the outlet union, valve means in the passage for controlling the flow rate of both cold and warm water and for mixing together said cold and warm water and directing the resulting controlled flow to said outlet union, and a delivery spout comprising a spout body, an inlet union and a delivery mouth, the inlet union of the spout being complementary to and cooperable with and detachably connectible to said outlet union of the cock unit body, said outlet union of the cock unit body comprising an internally threaded sleeve, said inlet union of the spout comprising a cylindrical seat complementary to the external surface of said sleeve, a sealing gasket that seals between said spout and said sleeve, and a threaded fastener member screwed into said internally threaded sleeve and releasably connecting said delivery spout to said outlet union of the cock unit body.

3,943,962

UNIVERSAL EQUIPMENT FOR CONNECTING PIPE LINE FAVOURABLY FOR ADJUSTING VARIABLE ANGLES

Oszkár Nagy, Budapest, Hungary, assignor to Magyar Tudomanyos Akademia Kozponti Kemiai Kutato Intezet, Budapest, Hungary

Filed Mar. 6, 1974, Ser. No. 448,632
Claims priority, application Hungary, Mar. 6, 1973, MA 2457
Int. Cl.² F16K *5/06*
U.S. Cl. 137—270 **12 Claims**



1. An angularly adjustable pipe joint with a valve, comprising two releasably interconnectible half shells that are adjustable relative to each other in a meridian plane about an axis perpendicular to said plane, each of said half shells having a pipe boss thereon that has an axis, the axis of at least one of said pipe bosses being out of coincidence with the first-mentioned axis, a rotatable blocking and regulating element disposed within the two half shells and having a bore therethrough out of registry with the first-mentioned axis, and means for rotating said element within said half shells about the first-mentioned axis, one end of said bore communicating with said boss of one of said half shells in all positions of said rotatable blocking and regulating element and said one half shell relative to each other, the other end of said bore communicating with said boss of the other of said half shells in less than all of the positions of said rotatable blocking and regulating element and said other half shell relative to each other.

3,943,963

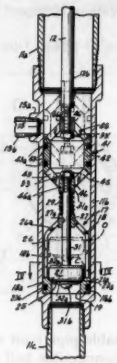
FROSTPROOF HYDRANTS FOR USE IN FLUID HANDLING

Frank C. Papacek, 3 N. 410 Maple Court, West Chicago, Ill. 60185

Filed Apr. 24, 1974, Ser. No. 463,447
Int. Cl.² E03B *9/14*
U.S. Cl. 137—283 **18 Claims**

1. In a frostproof hydrant structure including an elongated casing adapted for connection at an inner end portion thereof with a freeze-protected fluid source and having an opposite outer delivery end portion which may be exposed to freezing conditions, valve means within said casing adjacent to said inner end portion for controlling fluid flow from said fluid source to said delivery end portion, valve operating means accessible adjacent to said delivery end portion, said valve means including a valve seat body fitting replaceably within said inner end portion of the casing and a movable valve member cooperating with said valve seat body, means removably connecting the valve operating means to said outer end portion of the casing, means coupling said operating means in a unitary assembly with said valve member and said valve seat body, enabling the operating means to actuate the valve member between valve open and valve closed positions relative to said valve seat body and enabling insertion of the valve seat body and the valve member together into the casing and removal thereof together from the casing through said outer end portion of the casing as permitted by the unitary aassembly with the operating means; said valve seat body including an annular seat portion with which the valve member is engageable in closing relation, said valve operating means in-

cluding an actuating member attached to said valve member, a concentric guide on said body through which the actuating member extends for moving said valve member between valve open and closed positions relative to said valve seat portion, the improvement comprising:



a shoulder in said casing against which said valve seat body engages; and

biasing means acting between said guide and said actuating member to maintain an engagement bias of the valve seat body toward the shoulder.

3,943,964

HEATING DEVICE

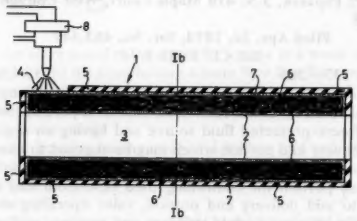
George Albert Apolonia Asselman; Adrianus Petrus Dirne, and Petrus Helena Gerardus Maria Vromans, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 159,205, July 2, 1971, abandoned. This application Dec. 19, 1974, Ser. No. 534,621

Claims priority, application Netherlands, July 7, 1970, 7009990

Int. Cl. F28d *15/00*; F27b *17/00*

U.S. Cl. 137—334 **6 Claims**



1. A furnace operable with a heat source and providing an isothermal heating chamber comprising first and second tubes, the first tube situated within the second with an annular space having first and second ends defined between the walls of said tubes and a bore defined within the first tube, and walls closing said ends of the annular space and sealing same, a vaporizable liquid heat-transporting medium within said annular space, said tube walls and end walls having inner surfaces defining said chamber, and having outer surfaces, said furnace further comprising capillary material on said inner surfaces, and compressed porous filling material within said chamber and supporting said tube walls from compression, said filling material and capillary material having pores, the hydraulic diameter of the filling material pores being greater than that of said capillary material, one portion of said outer surface being a heat transmission wall for receiving heat from said heat source, and said furnace being operable as a heat pipe.

3,943,965

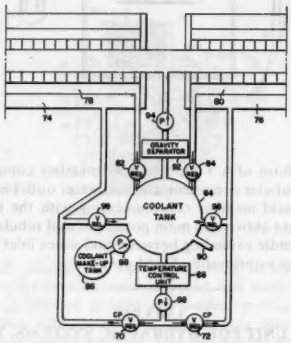
PIPELINE FOR TRANSPORTING PETROLEUM PRODUCTS THROUGH TUNDRA

John J. Matelena, 3576 E. State St. Extension, Trenton, N.J. 08619

Filed Sept. 7, 1973, Ser. No. 395,375

Int. Cl.² F17D *1/14*; F16L *9/18*

U.S. Cl. 137—340 **7 Claims**



1. A pipeline comprising a conduit for containing a fluid to be transported, means surrounding said conduit for transporting an optically transparent fluid, pumping means for causing said optically transparent fluid to flow through said means surround said conduit, means for directing a beam of light into said optically transparent fluid within said means surrounding said conduit, and photosensitive means for receiving said beam of light after said beam passes through a portion of said optically transparent fluid, whereby the leakage of a fluid from the interior of said conduit into the optically transparent fluid may be detected by said photosensitive means by reason of a change in the optical density of the fluid within said means surrounding said conduit.

3,943,966

IRRIGATION SYSTEM (LIFTING DOGS)

Ralph D. Boone, 2920 Axtell, Clovis, N. Mex. 88101

Filed Nov. 27, 1974, Ser. No. 527,598

Int. Cl.² A01G *25/02*

U.S. Cl. 137—344 **12 Claims**

1. In an agricultural irrigation system having

a. an elongated pipe adapted to carry sprinklers mounted thereon,

b. means for supplying water under pressure to said pipe,

c. a plurality of vehicles movingly supporting said pipe,

d. the improved means for driving each of said vehicles comprising:

e. a reciprocating cable,

f. power means for reciprocating said cable mounted upon said pipe,

g. a first run of said reciprocating cable extending from said power means for reciprocating said cable to a pulley mounted upon the end of the pipe,

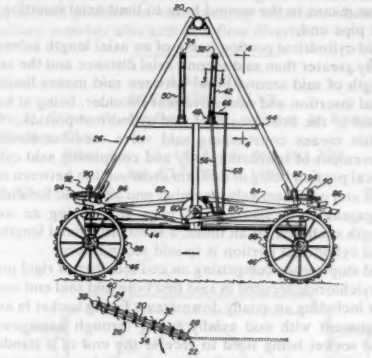
h. said reciprocating cable extending around said pulley and a second run of said reciprocating cable extending back to said power means,

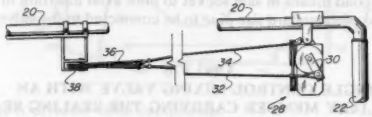
j. the end of said second run of said reciprocating cable mounted to said power means,

k. said power means being means for reciprocating the ends of the cable in equal and opposite directions,

m. said vehicles being designated numerically sequentially from said power vehicle,

n. said odd numbered vehicles being connected to said first reciprocating cable run,





o. said even numbered vehicles being connected to said second reciprocating cable run, and

p. transmission means on each vehicle for driving it responsive to the reciprocation of said cable.

3,943,967

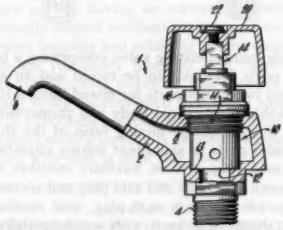
CARTRIDGE FAUCET

James W. Holt, Brookland, and John K. Meeks, Jonesboro, both of Ark., assignors to Crane Co., New York, N.Y.

Filed June 16, 1975, Ser. No. 587,015

Int. Cl.² F16K *25/00*

U.S. Cl. 137—454.5 **15 Claims**



1. A faucet comprising:

a. a housing having an interior chamber adapted to receive a valve cartridge, said housing having a fluid inlet and outlet,

b. a valve cartridge inserted within the interior chamber of said housing between said inlet and outlet, said cartridge including:

1. a base having an inlet port in communication with said fluid inlet;

2. a plunger freely positioned in said base in proximity to said inlet port, said plunger adapted to be displaced relative to said inlet port to allow fluid under pressure to pass therethrough;

3. a centerpiece enclosing said base and plunger, said centerpiece having a plurality of outlet ports in communication with said inlet port and said chamber;

4. a stem rotatably positioned in said centerpiece, said stem having a variable depth cam in one end thereof cooperating with said plunger whereby rotation of said stem permits said plunger to be displaced relative to said inlet port to thereby control the quantity of fluid passing through said inlet port.

3,943,968

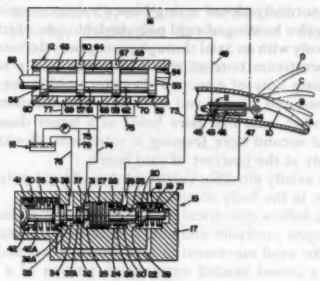
COMBINATION LOCK AND RELIEF VALVE FOR HYDRAULIC SYSTEMS

Ernest Treichler, Irvine, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Jan. 6, 1975, Ser. No. 538,923

Int. Cl.² F16K *17/22, 31/12*

U.S. Cl. 137—493 **11 Claims**

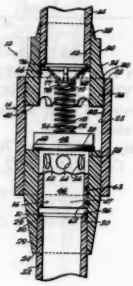


1. A combination lock and relief valve comprising a housing having a valve chamber, a lock cylinder and a relief cylinder, a lock piston dividing the lock cylinder into first and second lock chambers, a relief piston dividing the relief cylinder into first and second relief chambers, said first lock chamber communicating with said valve chamber, a valve poppet movable in said valve chamber for opening and closing the valve chamber relative to said first lock chamber, a first actuator port connected to the valve chamber, a second actuator port connected to said first lock chamber, said first actuator port at times serving as an inlet for fluid and at other times as an outlet for fluid, said second actuator port serving as an outlet for fluid when said first actuator port serves as an inlet and serving as an inlet for fluid when the first actuator port serves as an outlet, a high pressure port connected to the second lock chamber, an exhaust port connected to the first relief chamber, a passage connecting the second relief chamber to the valve chamber, said lock piston being movable by high pressure in said second lock chamber into engagement with said valve poppet for moving the latter to open position, and said relief piston being movable by pressure in said second relief chamber into engagement with said lock piston to move the latter into engagement with said poppet for moving the poppet to its open position.

3,943,969
POSITIVE ACTING CHECK VALVE OF POLYVINYLCHLORIDE TO OPEN IN RESPONSE TO PREDETERMINED LINE PRESSURE

Albert Rubin, 2051 Bahama Drive, Miramar, and Benjamin H. Travis, 3901 SW. 59 Ave., West Hollywood, both of Fla. 33023

Filed Apr. 25, 1975, Ser. No. 571,681
Int. Cl.² F16K *15/02*
U.S. Cl. 137—538 **4 Claims**



1. A normally closed spring-biased valve comprising:

A. a valve housing of rigid polyvinylchloride which includes a body with an axial through passageway defined by a first downstream bore of a first diameter and a second upstream bore of a second diameter, said bores being opposed and aligned and in fluid communication with one another, said first bore being of a larger diameter than said second bore forming a valve seat shoulder in said body at the juncture of said bores;

B. an axially movable valve member of rigid polyvinylchloride in the body comprising:

a. a hollow cylindrical portion in said second bore with an open upstream end and a uniform cross section sized for axial movement in said second bore, and

b. a closed headed downstream portion of a cross sectional area less than that of the first bore and greater than that of the second bore and effective to mechanically limit axial upstream movement of said cylindrical portion in said second bore,

c. said cylindrical portion having a plurality of radial openings arranged in a circumferential path which is axially spaced from said headed end a first axial distance to permit fluid flow from the interior of the hollow cylindrical portion downstream into the first bore when the openings are in the first bore;

C. stop means having an axially facing through passageway in said first bore, said stop means being axially from said valve seat shoulder a second axial distance which is greater than said first distance to mechanically limit downstream axial movement of the valve member, so that the radial openings are in fluid communication with the first bore when the valve member is in engagement with said stop means;

D. an O-ring circumposed about said cylindrical portion and in abutting relation with said headed portion, said O-ring being sized to seal against fluid flow between said first bore and said second bore when said O-ring is captivated between said headed portion and said valve seat shoulder;

E. compression spring means including means captivating said spring means between said stop means and said headed portion, said spring means being effective to normally urge said O-ring into sealing engagement with said headed portion and said valve seat shoulder and effective to yieldingly permit said valve member to move axially downstream in response to a predetermined upstream fluid pressure in said second bore to permit fluid flow through the hollow cylindrical portion, said radial openings, said axial through openings and said first bore;

F. said second bore being sized to receive the ends of a standard companionate size diameter pipe to be connected in axial alignment with the valve;

G. first means in the second bore to limit axial insertion of the pipe end;

H. said cylindrical portion being of an axial length substantially greater than said second axial distance and the axial length of said second bore, between said means limiting axial insertion and said valve seat shoulder, being at least equal to the axial length of said cylindrical portion;

I. guide means constraining said valve member to axial movement of translation only and comprising said cylindrical portion being of uniform cross section between said seat and upstream valve member end and sized for sliding engagement in said second bore and having an axial length such that, at all times, a substantial axial length of said cylindrical portion is in said second bore;

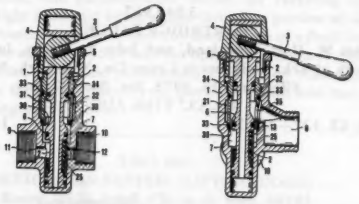
J. said stop means comprising an end member of rigid polyvinylchloride secured in said first bore and said end member including an axially downstream facing socket in axial alignment with said axially facing through passageway, said socket being sized to receive the end of a standard companionately sized diameter pipe to be connected in axial alignment with the valve; and

K. second means in said socket to limit axial insertion of an end of a standard size pipe to be connected to the valve.

3,943,970
SINGLE CONTROL MIXING VALVE WITH AN AUXILIARY MEMBER CARRYING THE SEALING SEAT

Alfons Knapp, Bleicherstrasse 3, Biberach an der Riss, Germany

Filed Apr. 15, 1974, Ser. No. 461,098
Claims priority, application Italy, May 11, 1973, 68344/73
Int. Cl.² F16K *11/22*
U.S. Cl. 137—597 **1 Claim**



1. A single control mixing valve comprising a body, in said body inlet ports for fluids to be mixed and an inner mixing chamber and two outlet ports for mixed fluid, a rotatable and axially movable plug in said body and cooperating with said inlet ports to control the mixing ratio of the fluids flowing from said inlet ports to said inner mixing chamber, a sealing gasket on said plug, and an auxiliary member sealingly inserted between said body and said plug and connected to said body independently from said plug, said auxiliary member having the shape of a bush with a substantially cylindrical inner wall and being traversed by an opening interconnecting said inner mixing chamber selectively with either of said outlet ports, the inner end of said auxiliary member having a sealing seat cooperating with said sealing gasket of the plug to control the flow rate of the mixed fluid flowing from said inner mixing chamber to said outlet ports of the body, said auxiliary member having the sealing seat being mounted within said body for rotation through at least a limited angle between a first position in which said opening communicates with one said outlet port and a second position in which said opening communicates with the other said outlet port, a control lever connected to said auxiliary member to rotate said auxiliary member, said

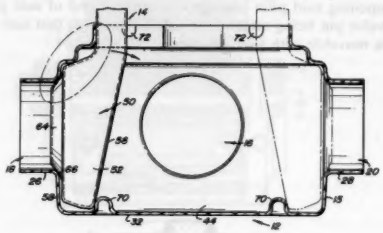
auxiliary member further having a closing gasket carried thereby that seals between said auxiliary member and said body entirely about said other outlet port in said first position of said auxiliary member and that seals between said auxiliary member and said body entirely about said one outlet port in said second position of said auxiliary member, whereby said auxiliary member also acts as a flow diverter.

3,943,971

DIVERTER VALVE

John D. Schmunk, Findlay, Ohio, assignor to Hancor, Inc., Findlay, Ohio

Filed Apr. 16, 1974, Ser. No. 461,389
Int. Cl.² F16K *11/00*
U.S. Cl. 137—610 **9 Claims**



1. A diverter valve comprising:

a housing having a continuous side wall, a bottom wall and a top wall defining a hollow valve chamber, said housing including an inlet opening and said side wall including at least two spaced apart outlet openings with said inlet and outlet openings communicating from outside said housing with said chamber, said top wall including a valve element receiving opening and said housing further having a valve seat disposed around each of said at least two outlet openings;

a valve element receivable in said chamber through said element receiving opening and movable through said receiving opening between separate spaced blocking positions in said chamber for selectively blocking at least one of said outlets and allowing communication through said chamber between said inlet and the other of said outlets, said valve element comprising a body having top and bottom portions and front and rear face portions, said front face portion having an outwardly extending generally conically shaped resilient sealing surface; and,

valve element locating and retaining means disposed in said chamber for releasably retaining said valve element in said separate blocking positions, said locating and retaining means being located such that when said valve element is in a blocking position with said at least one outlet, said resilient sealing surface is deflected by the valve seat associated with said at least one outlet.

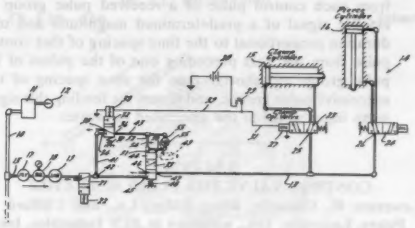
3,943,972

SYSTEM FOR CONSERVING COMPRESSED AIR SUPPLY

Paul A. Bitonti, Washington, Pa., and John P. Lytle, Troy, Mich., assignors to Ross Operating Valve Company, Detroit, Mich.

Filed Apr. 29, 1975, Ser. No. 572,898
Int. Cl.² F15B *21/08*
U.S. Cl. 137—624.11 **7 Claims**

1. In a system for conserving the compressed air supply from a main line to a work station having a control valve, an air saver valve interposed between said main line and said control valve, means normally urging said air saver valve in a position blocking flow from said main line to said control valve, means for selectively shifting said control valve between first and second positions, means responsive to each shifting of said control valve to its second position for shifting said air saver valve from its blocking position to an open position permitting flow from said main line to said control valve, and



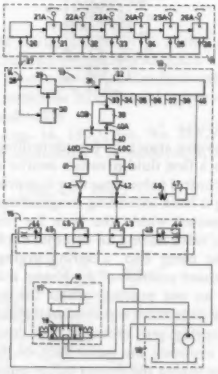
timing means for permitting said urging means to return the air saver valve to its blocking position after a predetermined time interval in the event that said control valve has not been shifted to its second position during said interval.

3,943,973

CONTROL SYSTEM

Ted Zettergren, Lundevarv, Sweden, assignor to Tedeco AG, Zug, Switzerland

Filed Mar. 21, 1975, Ser. No. 560,932
Claims priority, application Sweden, Mar. 22, 1974, 7403901
Int. Cl.² F15B *13/06*
U.S. Cl. 137—624.15 **3 Claims**



1. A system for remote proportional positioning of a plurality of hydraulic directional control valves, comprising

a. a signal transmitter having a plurality of manual operating members, a pulse generator for repetitively producing a pulse group comprising an initial pulse and a plurality of control pulses, one for each operating member, following in time-spaced succession after the initial pulse, and means for changing the time spacing of each control pulse from the next preceding one of the pulses of the pulse group in accordance with the position of the associated operating member,

b. a plurality of electrohydraulic converters associated with respective ones of the operating members and adapted to be connected to an associated one of the control valves to be positioned, each such converter including means for producing a hydraulic positioning signal proportional to an electric input signal, and

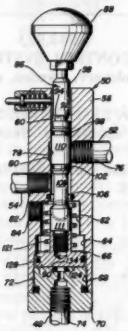
c. a transmission unit for the transmission of the pulse groups from the signal transmitter and for deriving from the pulse group an electric input signal for each converter, including a decoder having an input for the pulse groups from the signal transmitter, means for deriving from each control pulse of a received pulse group an electric signal of a predetermined magnitude and of a duration proportional to the time spacing of that control pulse from the next preceding one of the pulses of the pulse group and shorter than the time spacing of two successive pulse groups, and means for feeding this signal as an input signal to the associated converter.

3,943,974

CONTROL VALVE FOR FLUID ACTUATOR

Lawrence K. Connelly, River Ridge, La., and Clifford M. Peters, Longview, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Mar. 24, 1975, Ser. No. 560,768
Int. Cl.² F16K *31/00*
U.S. Cl. 137—624.27 **8 Claims**



1. A control valve structure for controlling fluid communication between a first fluid pressure source and a main valve actuator, said control valve structure comprising an elongated housing having a bore extending longitudinally thereof and a slide valve mounted within the bore for longitudinal movement, said slide valve having an external knob on one end and a piston on the other end, a spring urging the slide valve inwardly to a seated position of the piston, a detent to hold the slide valve in an out position when the knob is manually gripped and the slide valve is moved to the out position against the bias of the spring, port means in fluid communication with said bore and exposing the outer face of the piston to fluid pressure, means urging the detent out of engagement with the slide valve and releasing the slide valve when the outer face of the piston is exposed to a predetermined high pressure from said port means, and a resilient annular seal between the port means and the outer face of the piston exposing only a relatively small surface area of the piston to fluid pressure from said port means when the piston is in a seated position, said annular seal permitting the entire outer face of said piston to be exposed to fluid pressure from said port means when the piston is out of seated position.

3,943,975

SOLENOID OPERATED PILOT CONTROLLED VALVE

William E. Schnittker, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Nov. 6, 1974, Ser. No. 521,246
Int. Cl.² F16K *31/40*
U.S. Cl. 137—630.14 **8 Claims**

1. A valve comprising:

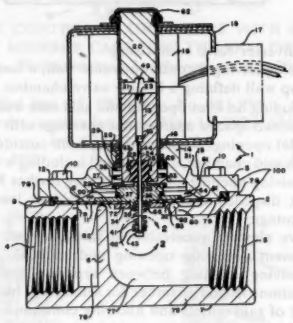
a valve body having an inlet, an outlet, a main flow port between said inlet and said outlet, and a chamber about said main flow port on the inlet side of said main flow port;

a flexible diaphragm mounted for movement in said chamber between a first position closing said main flow port and a second position opening said main flow port, said diaphragm having an opening in it to permit fluid flow between said inlet and said chamber;

a pilot valve member mounted to said diaphragm and movable therewith, said pilot valve member having a pilot opening through it, said pilot opening communicating with said chamber and said outlet;

a valve pin mounted in said pilot opening, said valve pin having a first end and a second end;

a solenoid mounted to said valve body, said solenoid including an actuator mounted for movement between a first position closing said pilot passage, and a second position opening said pilot passage, the second end of said pilot valve pin being attached to said actuator so that said pin is movable with said actuator;



a first spring means mounted in said chamber and adapted to insert a force on said diaphragm so as to urge said diaphragm towards its closed position;

second spring means mounted on the outlet side of said diaphragm and adapted to bias said diaphragm toward its open position in at least one position of said diaphragm, said second spring means being attached to said pilot valve member on a first end of said second spring means, a second end of said second spring means being adapted to engage the first end of said valve pin in at least a first position of said diaphragm, said second end of said second spring being spaced and free from the first end of said valve pin in at least another position of said diaphragm, the distance between said second spring means end and said valve pin being approximately twenty thousandths of an inch (0.0020); and

third spring means biased between said solenoid and said actuator so as to urge said actuator towards its closed position.

3,943,976

CONTINUOUS INSERTION WEAVING MACHINE

Hilario Serrallonga Vilaseca, Barcelona, Spain, assignor to Maquinaria Textil Del Norte De Espana S.A.-Matesa, Barcelona, Spain

Continuation-in-part of Ser. No. 469,885, May 14, 1974, abandoned, which is a continuation of Ser. No. 295,576, Oct. 6, 1972, abandoned. This application Sept. 5, 1974, Ser. No. 503,516

Claims priority, application Spain, Oct. 6, 1971, 396118; Sept. 12, 1972, 406875

Int. Cl.[2] D03D *47/26*

U.S. Cl. 139—12 15 Claims

1. In a continuous insertion weaving machine of the progressive shed type and including warp beam means for supplying warp threads; shed tunnel means, aligned with said warp threads passing therethrough, for continuously passing weft threads carried by inserters between said warp threads, thereby weaving a fabric; and woven fabric beam means for collecting fabric woven in said shed tunnel means; the improvement wherein:

said shed tunnel means comprises:

two separate parallel tunnels within a single frame;

first and second chain driving means, one each mounted on said frame between adjacent ends of said two tunnels;

first and second endless chains, both mounted about said first and second chain driving means, said first and second chains each having opposite non-linear runs around portions of peripheries of said first and second chain driving means, means to cause said first and second chains to be coupled to each other and coupled to said chain driving means during said non-linear runs, said first and second chains each having opposite linear runs between said non-linear runs, means to cause said first and second chains to be separated and uncoupled from each other during each of said linear runs, said first and second chains during each of said linear runs extending along opposite sides of a separate one of said two tunnels;

warp thread control means mounted within each of said tunnels; and

means carried by and movable with each of said chains for continuously moving said warp thread control means transversely of said respective tunnel to thereby control the paths of said warp threads, and for continuously moving said inserters through said tunnels;

said warp beam means comprises means for supplying separate pluralities of warp threads to each of said tunnels; and

said woven fabric beam means comprises first and second beams, one for collecting fabric woven in each of said tunnels.

3,943,977

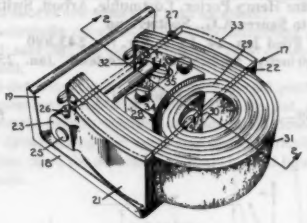
PICKER STICK CHECK

William N. Conway, North Grafton, Mass., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 3, 1975, Ser. No. 546,316

Int. Cl.[2] D03D *49/40*

U.S. Cl. 139—166 4 Claims



1. In a loom having a rock shaft, a lay beam oscillatable with the rock shaft and picker sticks for picking a shuttle back and forth across the width of the loom, a picker stick bumper assembly comprising:

a. a support bracket for attachment to the loom;

b. resilient bumper means secured to said support bracket;

c. picker stick braking means operatively associated with and for cooperative action with said resilient bumper means; and

d. means mounting said picker stick braking means for floatable movement on said support bracket so that said braking means can move in directions parallel and transverse to the direction of lay beam travel.

3,943,978

METHOD OF AND APPARATUS FOR LATERAL TENSIONING OF FABRICS

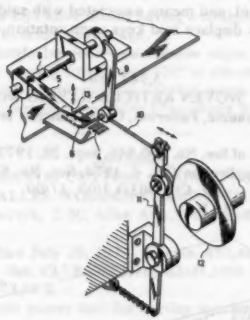
Jaromir Jindra, Tyniste nad Orlici, Czechoslovakia, assignor to Elitex, Zavody textilniho strojirenstui, generalni reditalstui, Liberec, Czechoslovakia

Filed Aug. 16, 1973, Ser. No. 388,934

Claims priority, application Czechoslovakia, Aug. 16, 1972, 5672-72

Int. Cl.[2] D03J *1/20*

U.S. Cl. 139—292 7 Claims



2. Apparatus for laterally tensioning a fabric at a predetermined width during the advancement of a fabric as it is woven on a weaving machine employing an advancing warp and means for inserting weft in a stepwise manner, comprising means for forming the fabric with at least one auxiliary longitudinal fabric strip along a selvedge and spaced from the selvedge by uncovered warp threads, means for penetrating between the uncovered weft threads by alternately engaging

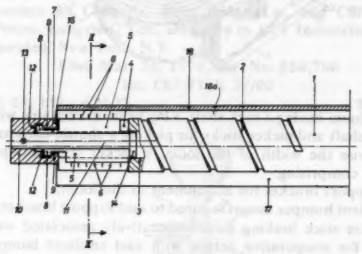
and deflecting said weft threads from above and below as the fabric is advanced, and means for separating the auxiliary strip from the fabric selvedge upon further advancement of the fabric.

3,943,979

AUTOMATIC TEMPLE FOR WEAVING LOOMS

Allan William Henry Porter, Lustmuhle, Arbon, Switzerland, assignor to Saurer A.G., Switzerland

Filed Jan. 24, 1975, Ser. No. 543,890
Claims priority, application Switzerland, Jan. 25, 1974, 1068/74
Int. Cl.² D03J 1/22
U.S. Cl. 139—296 5 Claims



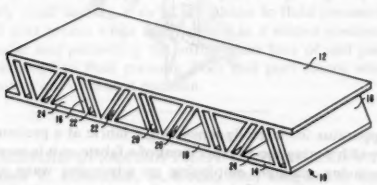
1. An automatic temple for feeding a web in weaving looms, comprising a stationary hollow bar having a bar bore and having a slot extending outwardly from said bar bore and longitudinally between the ends of said hollow bar, a circularly cylindrical rod of greater diameter than said slot arranged in the bar bore of said hollow bar and being rotatable for winding the web therearound which is fed into the slot around said rod and out said slot, at least the ends of said rod being tubular and having a rod bore, a guide body disposed alongside each end of said rod and being secured to said hollow bar for preventing the rotation thereof, a plurality of circumferentially spaced longitudinal keyways extending through the wall of the tubular part of said rod, a key guided for radial and longitudinal movement in each of said keyways and each having an outer end with a needle point and being radially movable so as to alternately project and withdraw said needle points from the surface of said rod, and means associated with said rod and said guide body to displace said keys upon rotation of said rod.

3,943,980

MULTI-PLY WOVEN ARTICLE HAVING DOUBLE RIBS

Walter A. Rheaume, Fullerton, Calif., assignor to Hitco, Irvine, Calif.

Continuation of Ser. No. 290,546, Sept. 20, 1972, abandoned. This application Oct. 4, 1974, Ser. No. 512,290
Int. Cl.² D03D 3/00, 11/00
U.S. Cl. 139—384 R 4 Claims



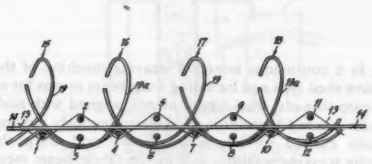
1. A woven panel construction comprising a pair of woven face members disposed in generally parallel, space-apart relation along the length of the panel and having generally like widths, and a plurality of woven rib members disposed between said face members, said rib members being spaced-apart in pairs along the length of the face members and alternately extending between the face members in a zig zag configuration, the rib members of each pair being interwoven with both of the face members and substantially parallel and spaced-apart between the face members to define a relatively thin, generally planar opening between each pair which extends the entire distance between the face members in the direction of the plane thereof, the pairs of rib members defining major openings of generally triangular-shaped cross-sections on opposite sides of each of the relatively thin, generally planar openings and between the face members.

3,943,981

HOOKING-UP DEVICE

Jean Leon Philemon Isidor Pierre De Brabander, Hamme, Belgium, assignor to Velcro S.A., Nylon, Switzerland

Continuation-in-part of Ser. No. 824,485, May 14, 1969, abandoned. This application Mar. 25, 1974, Ser. No. 376,036
Claims priority, application Belgium, Jan. 24, 1969, 48739
Int. Cl.² D03D 27/00; A44B 17/00
U.S. Cl. 139—391 23 Claims



1. In a fabric fastener having first and second woven support members formed of weft and warp including raised elements of complementary geometrical configuration adapted for interpenetration therebetween whereby said support members are held in intimate relationship, the improvement comprising:

a. a weft comprising a plurality of yarns,

b. a warp comprising a plurality of yarns including

1. a ground warp comprising a plurality of yarns interwoven with said weft yarns,

2. a stuffer warp in at least one of said support members comprising a plurality of elastic yarns, and

3. a pile warp comprising a plurality of yarns interwoven with said weft and forming said raised elements, wherein at least one of said support members is stretchable over a range of up to at least twice its unstretched length in at least one axial direction thereof, and wherein the length of the yarns comprising the ground and pile warps interwoven within the support having the elastic stuffer warp is sufficient to provide means for permitting recoverable extensibility over said range while said support members are in intimate relationship without loss of interpenetration of said elements.

3,943,982

APPARATUS FOR INTERNALLY CHECKING WELL PIPE BORE AND FOR AUTOMATICALLY SEALING LEAKS THEREIN

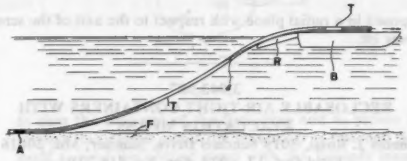
Michel G. Lecordier, Marseille, France, assignor to Compagnie Francaise des Petroles, S.A., Paris Cedex; Etudes Petrolieres Marines, S.A.R.L., Paris; Ateliers et Chantiers de Bretagne - A.C.B. - S.A., Nantes; Compagnie Maritime d'Expertises, S.A., Marseille and Compagnie Generale pour les Developpements Operationnels des Richesses sour-Marines (Doris) S.A., Paris, all of, France

Filed Aug. 19, 1974, Ser. No. 498,677

Claims priority, application France, Aug. 27, 1973, 73.30931

Int. Cl.² F16L *55/10*

U.S. Cl. 138—89 14 Claims



1. In an apparatus for plugging the bore of a pipe, and including a frame movable along the interior of a pipe, means for locking the apparatus relative to the pipe, means for sealing the pipe, and control means movable relative to the frame and operably connected to the locking means and the sealing means, the improvements comprising: a) means for detecting a linear deviation greater than a preset value in the bore of the pipe, and b) means responsive to a fluid overpresssre exerted in a direction opposite to the direction of movement of the apparatus along the pipe, c) the locking means and the sealing means being operable by the movable control means in response to the deviation detecting means and the overpressure responsive means.

3,943,983

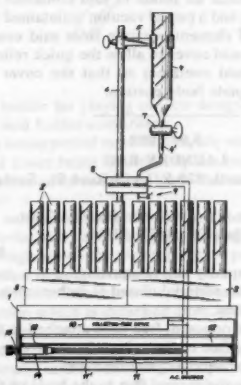
MOISTURE SENSING SYSTEMS FOR ELECTRICALLY OPERATED LIQUID-HANDLING DEVICES

Daniel Gelfand, Cliffside Park, N.J., assignor to Buchler Instruments, Div. of Searle Analytic, Inc., Fort Lee, N.J.

Filed May 23, 1974, Ser. No. 472,901

Int. Cl.² B65B *57/16*

U.S. Cl. 141—192 4 Claims



1. A fraction collector comprising:

a support;

an upwardly open tray mounted on said support and having a pitched surface;

electrically operated means on said support for carrying an array of upwardly open vessels successively past a location fixed relative to said support and above said tray;

a source of liquid mounted on said support;

a dispensing tip on said support for discharging said liquid into successive vessels at said locations;

an electrically operated valve interconnecting said source and said tip for controlling the flow of liquid to said vessel;

liquid-detector means at the bottom of said pitched surface responsive to the presence of liquid thereat; and

an electric switch operated by said liquid-detector means for deenergizing said valve and said electrically operated means upon the detection of liquid by said liquid-detector means.

3,943,984

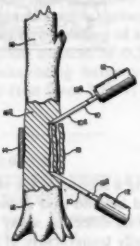
TREE SHEARS

Homan Benjamin Kinsley, Jr., Richmond, Va., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 24, 1974, Ser. No. 517,733

Int. Cl.² A01G *23/08*

U.S. Cl. 144—34 R 6 Claims



1. An apparatus for slashing tree trunks into logs, comprising:

a. at least two knife means positioned at an angle relative to each other adapted for positioning upon one side of the tree,

i. each of said knife means having a straight outside edge and a beveled inside edge,

ii. said angle between said outside edges of said knife means varying from about 120° to about 40°, and

iii. said angle between said beveled edges of said knife means varying from about 0° to about 30°.

3,943,985

APPARATUS FOR CUTTING ALIGNED NOTCHES IN PARALLEL WOODEN FRAME MEMBERS

Hans J. Wowczyk, 2 N. Atlas Ave., Thousand Oaks, Calif. 91360

Filed July 29, 1974, Ser. No. 492,404

Int. Cl.² B27C *5/10;* B26D *5/08*

U.S. Cl. 144—134 A 4 Claims

1. A portable power tool for cutting notches of predetermined cross section in a series of boards which are connected together in parallel relation and have outer coplanar faces, said tool comprising:

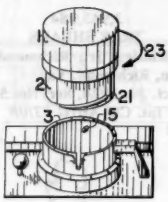
a body adapted to be held and be manipulated by a user;

means forming a first guide surface carried by said body lying essentially in a predetermined plane and facing in a first direction toward said boards to abut against and move across said outer faces of the boards and thereby locate the body against movement in said direction beyond a predetermined position;

a rotary cutter carried by said body and mounted for rotation relative thereto about an axis which extends essentially perpendicular to said plane, said cutter projecting in said first direction beyond said plane of said first guide surface, and having a diametrical cross sectional configuration corresponding essentially to said predetermined cross section of the notches to cut aligned notches of said predetermined cross section in said outer faces of the boards as said first guide surface moves thereacross;

said first guide surface extending at least partially about said rotary cutter to engage said faces of the boards at different sides of the cutter;

a motor carried by said body for driving said cutter rotatively about said axis and located beyond said plane of the first guide surface in a second direction away from said boards;



means forming a second guide surface carried by said body and located beyond said plane of the first guide surface in said second direction away from said boards, and facing essentially transversely of said axis of the cutter, and constructed to engage a straight side edge of an elongated guide member which is secured temporarily to and extends across said boards outwardly beyond said faces, and adapted to move along said side edge in a predetermined relative orientation as a cut is made in the boards; and

means forming a third guide surface carried by said body and located beyond said plane of the first guide surface in said second direction away from said boards and facing in said first direction at a location to abut in said first direction against and move slidably along an outer face of said temporary guide member;

there being no part of said tool other than said rotary cutter which projects in said first direction beyond the plane of said first guide surface.

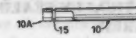
3,943,986

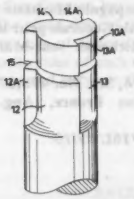
SCREW DRIVER BIT

Sixten Harald Lejdegard, Ramnas, Sweden, assignor to Bulten-Kanthal AB Hallstahammar, Sweden

Filed Mar. 4, 1975, Ser. No. 555,196
Claims priority, application Sweden, Mar. 4, 1974, 7402839
Int. Cl.² B25B *15/00*
U.S. Cl. 145—50 B **3 Claims**

1. A screw driver bit for use with power screw drivers, comprising a foremost drive tip for engagement with the drive recess of the screws and a rear mounting end for removable attachment of the screw driver bit to a drive socket of the power screw driver, wherein the mounting end has three circumferentially symmetrically spaced axial recesses which in crosssections perpendicular to the screw driver bit axis have the shape of half crescents in that they each at one edge merge with the circular cylindrical outer surface of the screw driver bit whereas they at the opposite edge are defined by a flat surface facing opposite the screw tightening direction and





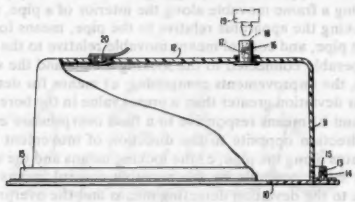
disposed in a radial plane with respect to the axis of the screw driver bit.

3,943,987

RECLOSABLE AIR-TIGHT CONTAINERS WITH EVACUATION MEANS

Thomas J. Rossi, 5019 Sentinel Drive, Sumner, Md. 20016

Filed Oct. 17, 1974, Ser. No. 515,719
Int. Cl.² B65D *51/16, 81/20*
U.S. Cl. 150—.5 **2 Claims**



1. A reusable and reclosable plastic container for foodstuffs and the like comprising a substantially flat plate body portion having an upstanding continuous blade-like sealing flange near its margin, a separable dome-like cover for the plate body portion having a continuous grooved female sealing element near its margin positioned to receive therein said blade-like sealing flange, whereby said body portion and said cover may be assembled repeatedly and separably in hermetically sealed relationship, an evacuation one-way closing check valve unit on the top of said cover adapted for connection with a vacuum source whereby residual air inside of said container may be exhausted therefrom and a partial vacuum maintained therein, and a vacuum relief element separate from said evacuation check valve unit on said cover to allow the quick relief of the partial vacuum in said container so that the cover can be separated from the plate body portion.

3,943,988

LAUNDRY BAG

Sebastian John Consorti, 820 S. McClelland St., Santa Maria, Calif. 93454

Filed Feb. 21, 1975, Ser. No. 551,784
Int. Cl.² B65D *33/16*
U.S. Cl. 150—7 **8 Claims**

1. An improved laundry bag comprising:

a. a body of flexible material closed at its bottom and sides and open at its top;

b. a pair of flexible opposed, free flaps attached to the body only at its top, a first of these flaps for overlying laundry and a second for overlying the first; and

c. means to secure the second flap to the body of the laundry bag to close the open end thereof, the securing means including a first strap affixed to the body, the first strap

having hook and pile type fastener means and a free end, and a second strap secured to the second flap at both ends of the second strap, the middle of the second strap being free of the second flap, the second strap being positioned

to pass the free end of the first strap and to secure the second flap closed when the first strap is fastened onto itself around the second strap with the fastener means, the first flap overlies laundry, and the second flap overlies the first flap.

3,943,989

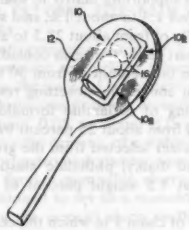
BALL HOLDER

Charles A. Sperling, c/o Cross Newform Plastics Co., Inc., 392 W. Boylston St., Worcester, Mass. 01606

Filed Oct. 9, 1973, Ser. No. 404,600

Int. Cl. B65d *65/02;* **A63b** *49/18*

U.S. Cl. 150—52 R **5 Claims**



1. A holder for playing objects designed to be struck by a racket, said holder comprising

A. an unsupported cover of flexible material for the racket, said cover being held taut by the racket when the racket is in the cover and being limp when the racket is removed, and

B. a substantially rigid cage for storing playing objects therein, said cage having an opening in one plane thereof through which the playing objects pass and having a first portion in said plane adjacent the opening for attachment tautly to a first exterior area of said cover and a second portion which is detached from said cover adjacent said first area, and

C. means for attaching said first cage portion to said cover whereby said cover closes the opening when the racket is in said cover and falls away from the opening at said detached portion when the racket is removed from said cover.

3,943,990

ANTI-SKID AND PROTECTIVE CHAIN

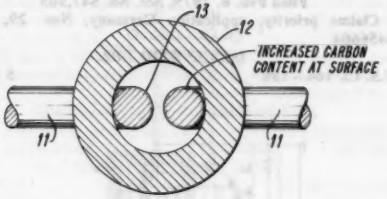
Hansjorg W. Rieger, Saarstrasse 48, 708 Aalen, Germany

Filed Oct. 4, 1974, Ser. No. 512,352

Claims priority, application Germany, Oct. 12, 1973, 2352080

Int. Cl.² B60C *27/00*

U.S. Cl. 152—243 **4 Claims**



1. An anti-skid chain for tires having a tread net which comprises closed interconnected horizontal links and vertical links, the horizontal links being of case hardened steel and having an inner width larger than that of the vertical links, said horizontal links having a recarburized surface zone of a maximum thickness of two millimeters and a carbon content of 0.5 to 0.9%, and said vertical links consisting of an alloyed super refined steel having a carbon content of 0.5 to 0.9%, said vertical and horizontal links being hardened with a grain hardness of at least 600 HV (test force 300 N) in the hardened condition.

3,943,991

METHOD AND APPARATUS FOR PREPARING FOUNDRY MOULDS OR CORES

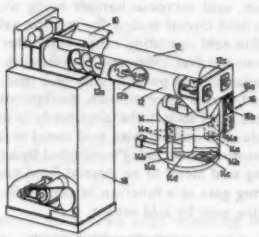
Albert Edwards, Peterborough, England, assignor to Baker Perkins Holdings Limited, England

Continuation of Ser. No. 376,431, July 5, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 567,890

Claims priority, application United Kingdom, July 14, 1972, 33003/72

Int. Cl.² B22C *5/12*

U.S. Cl. 164—21 **10 Claims**



1. A method of preparing a foundry mould or core from a cold-setting foundry sand mixture comprising the steps of

a. feeding a batch of sand and binder mixture in a first feed unit to a mixing chamber.

b. simultaneously feeding a batch of sand and catalyst mixture in a second feed unit to the mixing chamber.

c. mixing the batch of sand and binder mixture with the batch of sand and catalyst mixture in the mixing chamber,

d. discharging the mixed batches from the mixing chamber into a mould or core box under gravity,

e. purging the mixing chamber with compressed gas,

f. repeating steps (a) through (e) until a predetermined number of mixed batches are discharged into the mould or core box.

3,943,992

CONTROLLED-POURING APPARATUS FOR METAL CASTING

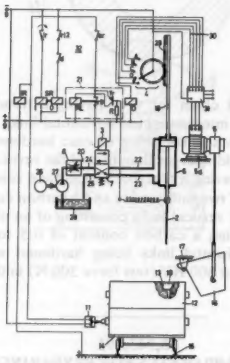
Fritz Mezger, Murten, Switzerland, assignor to Maschinenfabrik & Eisebgiesserei Ed. Mezger AG, Kallnach, Switzerland

Filed Feb. 6, 1975, Ser. No. 547,505

Claims priority, application Germany, Nov. 29, 1974, 2456604

Int. Cl.² B22D *1/02*

U.S. Cl. 164—156 **5 Claims**



1. An apparatus for a casting installation, for controlled pouring of molten metal during casting in a movable mold having a pouring gate, comprising a receptacle for said metal and a sensor having a lower end, said sensor being movable from a resting position, in which it is situated outside the range of movement of said mold at the location provided for pouring, into an operating range, in which said lower end projects into said pouring gate, and further comprising a servomechanism, electric circuit means including said sensor, motor means, and a control device including means for supporting said sensor, said servomechanism being automatically controlled by said circuit means for moving said sensor up and down within said operating range and, after pouring has begun, for causing said lower end to follow up the surface level of said metal in said pouring gate and thus intermittently to effect short-stroke up-and-down movements with respect to said surface level so as to be alternately in and out of electrically conductive contact with said metal in said pouring gate, and said motor means being controlled by said control device for causing said metal to be poured from said receptacle into said pouring gate as a function of said surface level sensed in said pouring gate by said sensor.

3,943,993

LOW TEMPERATURE STORAGE OF SURFACE ATTACHED LIVING CELL CULTURES

Kendall O. Smith, 133 Trillium Lane, San Antonio, Tex. 78213

Filed May 3, 1974, Ser. No. 466,909

Int. Cl.² F25B *13/00*

U.S. Cl. 165—2 **21 Claims**

1. In a process for cooling, storing and reviving surface attached living cultured cells, the steps of:

exposing living cultured cells which are attached to a surface of a storage vessel to a storage medium which is relatively non-toxic to such cells and which is compatible therewith during cooling to a temperature below 0°C, storage and subsequent warming processes;

cooling said vessel and the surface attached living cells therein to a storage temperature below 0°C effective for arresting the metabolism of the cells; and

storing said vessel and said surface attached cells at said storage temperature for an extended period of time.

3,943,994

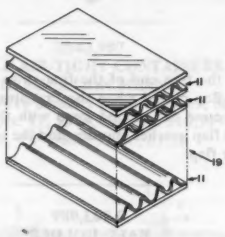
CERAMIC CELLULAR STRUCTURE HAVING HIGH CELL DENSITY AND METHOD FOR PRODUCING SAME

Joseph J. Cleveland, Wysox, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 313,101, Dec. 7, 1972, abandoned. This application Mar. 27, 1974, Ser. No. 455,193

Int. Cl.² F28D *17/00;* **B32B** *3/28*

U.S. Cl. 165—10 **5 Claims**



1. A cellular structure of green ceramic tape consisting essentially of finely divided sinterable solid particles of ceramic raw materials substantially uniformly distributed throughout a fugitive plastic supporting matrix, the cells of the structure being defined by alternate corrugated and flat ceramic tape members wherein said cells completely traverse the article from one face to the opposite face thereof, the weight ratio of said supporting matrix to said raw materials in said tape being about 1:3 to about 1:6, said supporting matrix consisting essentially of from about 28.5 to about 74.5 weight percent of a two part resin, the resin consisting essentially of polyvinyl butyral in the amount of from 50 to 95 weight percent, remainder an amine thermosetting resin selected from the group consisting of melamine formaldehyde and urea formaldehyde, and from about 25 percent to about 70 weight percent of a plasticizer selected from the group consisting of alkyl phthalate and dialkyl phthalate plasticizers, and from about 0.5 to about 1.5 weight percent of a deflocculating agent.

2. The structure of claim 1 in which the cells are defined by a spiral of a bilayered tape, the tape comprising a corrugated first tape member and a second flat tape member bonded together, the structure defining a rotary heat regenerator.

3,943,995

DAMPER ARRANGEMENT FOR CONTROLLING AIR OR FLUID FLOW

Edward J. Banko, 82 Longfellow Drive, Colonia, N.J. 07067

Filed Feb. 19, 1974, Ser. No. 443,731

Int. Cl.² F01P *7/10*

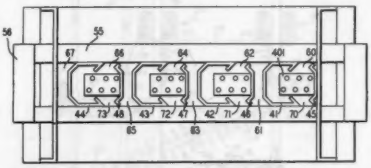
U.S. Cl. 165—101 **19 Claims**

14. Dampers for use in an apparatus for conditioning the flow of fluid therethrough where said conditioning is accomplished by moving said fluid in contact with a plurality of energy transfer means, said energy transfer means arranged in a vertical manner and grouped into sets, the sets defining first passages where fluid passing through said apparatus contacts said energy transfer means and second passages where fluid passes through said apparatus without contacting said energy transfer means,

said dampers arranged to selectively proportion fluid flow between the said passages, each said damper comprising

a first baffle arranged for mounting in a fixed relationship with each group of said energy transfer means, between said group and an adjacent said passage,

a second baffle arranged for mounting in movable relationship with each group of energy transfer means, each said second baffle arranged for a first mating relationship with the first baffle associated with the same energy transfer



means and a second mating relationship with the first baffle associated with an immediately adjacent energy transfer means, and

means for interconnecting and supporting all of said second baffles in fixed relationship to each other, said means operable for moving said second baffles into said first mating relationships thereby closing said first passages and operable for moving said second baffles into said second mating relationships thereby closing said second passages.

3,943,996

LOW FLUID LOSS CEMENTING COMPOSITIONS

Lawrence James Guilbault, McMurray, and Frederick Alan Hoffstadt, Coraopolis, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Division of Ser. No. 519,155, Oct. 30, 1974. This application June 27, 1975, Ser. No. 590,974

Int. Cl.² C08K *3/22;* **E21B** *33/14*

U.S. Cl. 166—293 **2 Claims**

1. A method of cementing a zone in a well penetrating a subterranean formation comprising injecting down the well and positioning in the zone to be cemented an hydraulic cement aqueous slurry composition comprising dry hydraulic cement, from about 0.05 to about 5.0 percent by weight, based on dry hydraulic cement, of a water-soluble polymer of methacrylamidopropyltrimethylammonium chloride, and sufficient water to form a pumpable slurry; and allowing the cement thus positioned to set to a monolithic mass; whereby loss of fluid from the cement slurry to the formation is reduced.

3,943,997

ROTARY DRILLING APPARATUS AND METHOD

Haggai D. Davis, 1910 McDermott Drive, Morgan City, La. 70380

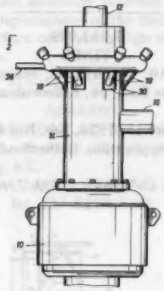
Filed Dec. 12, 1974, Ser. No. 531,903

Int. Cl.² E21B *37/00, 33/03, 7/18*

U.S. Cl. 166—312 **8 Claims**

1. Apparatus mounted on the bell nipple of a rotary drilling rig above the mud return line for breaking up large pieces of formation, such as gumbo, as the pieces reach the surface of the drilling mud in the bell nipple during drilling operations comprising a plurality of nozzles, means mounting the nozzles on the bell nipple directly above the mud return line whereby fluid flowing through the nozzles is directed into the mud as the mud reaches the mud return line to break up large pieces of formation as they reach the mud return line, and means for pumping drilling mud through the nozzles while drilling mud is being pumped upwardly in the bell nipple and laterally through the mud return line to carry pieces of formation from the well bore.

8. A method of rotary drilling comprising circulating drilling mud down the drill string and up the annulus into the bell nipple and laterally through a mud return line to the shale shaker and storage pits to carry pieces of formation out of the well bore, positioning a plurality of nozzles in the bell nipple



adjacent the mud return line to direct their discharge into the mud as it reaches the mud return line and directing a plurality of streams of drilling mud through the nozzles against the pieces of formation carried to the surface by the drilling mud as they reach the mud return line to break up the pieces sufficiently to flow laterally with the mud through the mud return line.

3,943,998

LAWN EDGE TRIMMING IMPLEMENT

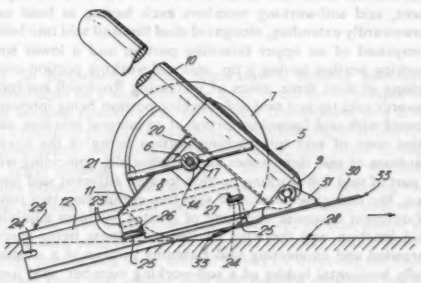
John Paul Flemming, 7 Serpentine Parade, Vaucluse, Sydney, New South Wales, Australia (2030)

Filed Feb. 10, 1975, Ser. No. 548,890

Claims priority, application Australia, Feb. 11, 1974, 6532/74

Int. Cl.² A01G *3/06*

U.S. Cl. 172—17 **11 Claims**



1. A blade-carrier for a lawn edge trimming implement including a handle which enables the implement to be manually traversed along a lawn edge with a blade in knifing relationship to said lawn edge, said blade-carrier comprising:

a. a blade holder consisting of a pair of spaced generally parallel cheek-plates joined together by a handle-receiving socket sleeve extending therebetween, said sleeve being provided with a shape having a given diameter, said sleeve, in joining said check-plates together, being joined to each of said check plates in such a manner that as said check-plates are drawn closer together, the diameter of said sleeve is diminished.

b. releasable clamping means to clamp said cheek-plates together and thereby to hold a removable knifing blade

when positioned between said cheek-plates and to diminish the diameter of said socket sleeve,

c. blade retention means to hold said knifing blade between said cheek-plates when said knife blade is positioned therebetween upon tightening of said clamping means,

d. an axle upon which said blade holder is mounted, and

e. two freely rotatable wheels on said axle, both being spaced from said blade holder and respectively located on either side thereof.

3,943,999

TINES

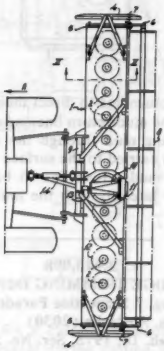
Ary van der Lely, 10, Weverskade, Maasland, and Cornelis Johannes Gerardus Bom, 36, Esdoornlaan, Rozenburg, both of Netherlands

Filed Mar. 13, 1974, Ser. No. 450,671

Claims priority, application Netherlands, Mar. 19, 1973, 7303763

Int. Cl.² A01B *33/00, 23/02*

U.S. Cl. 172—59 **18 Claims**



1. A soil-cultivating implement comprising a plurality of rotatable soil-working members located side-by-side in a row that extends transverse to the direction of travel of the implement, said soil-working members each having at least one downwardly extending, elongated steel tine and said tine being comprised of an upper fastening portion and a lower soil-working portion having a tip, said soil-working portion comprising at least three zones of increasing Rockwell hardness towards said tip and said soil-working portion being interconnected with said fastening portion at an integral junction, said third zone of said soil-working portion being of the lowest hardness of said three zones and substantially coinciding with a part of said soil-working portion located adjacent said junction, the fastening portion of said tine comprising two zones of different hardness, the zone of greater hardness adjoining said junction and the zone of lower hardness being screw-threaded and connecting said fastening portion in a substantially horizontal holder of a soil-working member, said junction being located adjacent the lower side of said holder.

3,944,000

ROTARY HARROWS

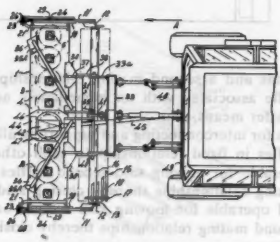
Ary van der Lely, 10, Weverskade, Maasland, and Cornelis Johannes Gerardus Bom, 36, Esdoornlaan, Rozenburg, both of Netherlands

Filed Apr. 16, 1974, Ser. No. 461,384

Int. Cl.² A01B *33/00, 63/00*

U.S. Cl. 172—59 **10 Claims**

1. A rotary harrow attachment comprising a frame and a plurality of rotary soil-working members mounted on a transverse frame portion of said frame, said transverse frame portion comprising driving means for said soil-working members to rotate said members on upwardly extending axes, a detachable coupling means on said frame for connection to a multi-point lifting hitch of a prime mover, said coupling means including an upwardly extending triangular configured coupling member and downwardly diverging struts connected to at least one generally vertical plate at the apex of said coupling member, the lower part of said coupling member and the lower ends of said struts each being connectable to the front or rear of said frame portion by plate means and bolts, spaced apart slotted plates being connected to said lower part, said coupling member being linked to a triangular coupling of a prime mover by a pivoted arm that interconnects said apex with the upper portion of said coupling and a shaft that extends through said slotted plates and an apertured member at the base of said coupling.



3,944,001

HYDRAULIC FOLDING MECHANISM FOR DISCS AND THE LIKE

William Warner, Tustin, and Dale Gordon, Santa Ana, both of Calif., assignors to Towner Manufacturing Company, Santa Ana, Calif.

Filed Sept. 16, 1974, Ser. No. 506,395

Int. Cl.² A01B *63/32, 63/22*

U.S. Cl. 172—311 **8 Claims**

1. A ground working implement having first and second sections and a folding mechanism therefor comprising in combination,

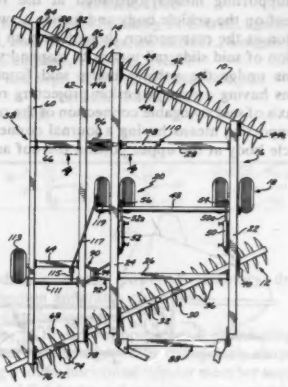
means affording a pivotal connection between said first and second sections of the implement,

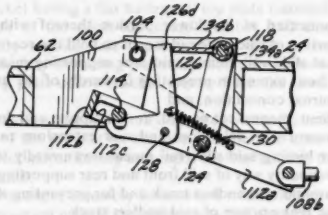
a source of power carried by said first implement section,

a lever directly connected to said source on one end thereof and to said second section on the other end thereof to respond to said source to rotate said second section about said first section at said pivotal connection from a first position to a second position,

and means for varying the mechanical advantage of said

source in pivoting said second section about said first section during movement thereof from said first position





to said second position comprising an arm rotatably connected to said first implement section and to said lever.

3,944,002

TINE MOUNTINGS

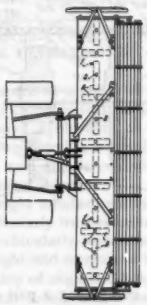
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland, and Ary van der Lely, 10, Weverskade, Maasland, Netherlands

Filed Feb. 29, 1972, Ser. No. 230,241

Claims priority, application Netherlands, Mar. 1, 1971, 7102669

Int. Cl.[2] A01B *15/00*

U.S. Cl. 172—763 **5 Claims**



1. A cultivator comprising a frame and a plurality of soil-working members mounted on said frame for rotation about upwardly extending axes, each soil-working member being a substantially vertical shaft with an elongated, substantially horizontal tine support at the lower end of said shaft, said support having opposite ends with cylindrical tine holders in the form of substantially vertical passageways that extend through the support, the top of each passageway being formed with a downwardly tapering conical surface and the bottom of the passageway being formed with an upwardly tapering conical surface, said passageway holding a fastening portion of a tine and said fastening portion extending through the passageway and being secured to said support, said tine having a multi-sided soil-working portion which is received by cooperating surfaces of said upwardly tapering conical surface to resist the angular displacement of the tine and said upwardly tapering conical surface comprising flats that interfit with flat portions of said tine.

3,944,003

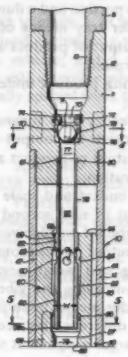
BORE HOLE AIR HAMMER

Alfred R. Curington, Houston, Tex., assignor to Bakerdrill, Inc., Spartanburg, S.C.

Filed Apr. 24, 1972, Ser. No. 246,837

Int. Cl.[2] E21B *5/00*

U.S. Cl. 173—73 **18 Claims**

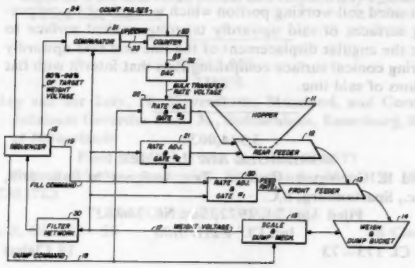


1. In percussion drilling apparatus: a housing structure connectable to a drill string; an anvil in the lower portion of said housing structure and operatively connectable to a drill bit; a hammer piston reciprocable in said housing structure for intermittently impacting against said anvil, said piston having an upper passage; inlet means for directing a fluid medium under pressure into said passage, first means for directing the fluid medium from said passage into said housing structure above said piston upon upward movement of said piston in said housing structure for driving said hammer piston downwardly toward said anvil; second means for directing the fluid medium from said passage into said housing structure below said piston upon downward movement of said piston in said housing structure for elevating said piston in said housing structure; means for alternately exhausting the fluid medium from the housing structure above and below said piston; said piston including means substantially closing the lower portion of said passage; said inlet means comprising means opening into said passage above said piston passage closing means for conducting the fluid medium under pressure directly into said passage for action against said piston passage closing means during the entire downward stroke of said piston toward and against said anvil; whereby the fluid medium under pressure acts concurrently over substantially the full cross-sectional area of said piston in driving said piston downwardly toward said anvil.

3,944,004
BATCH WEIGHING SYSTEM

C. Wayne Lafitte, and Thomas L. Thompson, both of P.O. Box 45873, Houston, Tex. 77045

Filed July 1, 1974, Ser. No. 484,584
Int. Cl.² G01G 13/04
U.S. Cl. 177—121 12 Claims



3. Apparatus for repetitively weighing and dumping preselected weight of a bulk granular product in a weigh and dump cycle having a weigh portion and a dump portion comprising:

first product feeder tray means of the vibratory type for delivering an output of product at a rate proportional to its speed of vibration;

means for delivering product under gravity flow into said first feeder tray;

second product feeder tray means of the vibratory type arranged to receive the output of said first feeder for delivering an output of product at a rate proportional to its speed of vibration;

weigh and dump bucket and scale means, arranged to receive the output of said second feeder tray means, for weighing the product so received and for generating an underdamped output signal representative thereof;

means for, during said weigh portion of said weigh and dump cycle, controlling the vibratory rates of said first and second feeder means in an underdamped manner in response to the difference between said output signal and a preselected target weighment signal;

means for, during said dump portion of said weigh and dump cycle, controlling the vibratory rate of said first feeder means only, in response to a bulk weighment representative output signal derived at an arbitrary time in the previous weigh cycle and functionally representative of a bulk weighment delivered from said first feeder means to said second feeder means during the previous dump portion of said weigh and dump cycle; and

control means responsive to said output signal for detecting when a predetermined amount of produce is delivered from said second feeder means to said weigh and dump bucket means and for initiating said dump portion of said weigh and dump cycle upon such occurrence.

3,944,005
SUSPENSION DEVICE FOR VEHICLES

Fujihiko Tomita, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

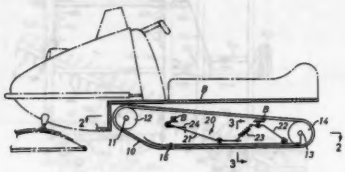
Filed Dec. 26, 1974, Ser. No. 536,393
Claims priority, application Japan, Dec. 28, 1973, 49-1955
Int. Cl.² B62D 27/02
U.S. Cl. 180—5 R 14 Claims

1. A suspension device for a motor driven snow vehicle having a flexible endless track driven by the power taken from the engine of the vehicle by way of a drive sprocket wheel journalled on the front portion of the vehicle body comprising:

slide rail means arranged longitudinally inside said endless track for holding engagement of the ground-engaging portion of said endless track with the ground and journalling rear idler wheels for said endless track at the rear end thereof,

front supporting means journalled at the front portion thereof on the vehicle body and having a swingable connection at the rear portion thereof with an intermediate portion of said slide rail means to suspend said slide rail means under the vehicle body, said front supporting means having a rear extension projecting rearwardly of the axis of said swingable connection of the rear portion,

rear supporting means having a journal connection on the vehicle body at the upper portion thereof and swingably



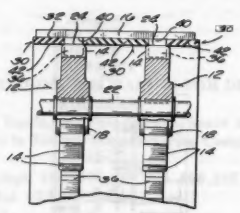
connected at the lower portion thereof with the rear portion of said slide rail means to hold the rear portion of said slide rail means, said rear supporting means having a front extension projecting forwardly of the axis of said journal connection, and

resilient means connected at the upper and lower ends thereof with said front and rear extensions respectively for biasing said slide rail means downwardly toward the ground by way of said front and rear supporting means to suspend said endless track and for preventing skidding of the rear portion of said endless track.

3,944,006
ENDLESS CLEATED TRACK

George G. Lassanske, Oconomowoc, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 15, 1974, Ser. No. 497,678
Int. Cl.² B62D 55/12
U.S. Cl. 180—9.62 10 Claims

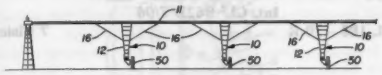


1. An endless track comprising a pair of endless flexible belts located in parallel spaced relation and having an outer surface and an inner surface, and a plurality of transversely extending traction bars mounted on said belt outer surfaces in parallel spaced relation, said traction bars having an inner side and each including a drive lug located in the spacing between said belts and projecting inwardly from said inner side of traction bar beyond said belt inner surfaces.

3,944,007
PLANETARY DRIVE SELF-PROPELLED IRRIGATION APPARATUS

Le Roy W. Thom, Minden; Rodney D. Eldred, and Douglas R. Soderquist, both of Hastings, all of Nebr., assignors to T - L Irrigation Company, Hastings, Nebr.

Filed Sept. 9, 1974, Ser. No. 504,127
Int. Cl.² B60K 7/00
U.S. Cl. 180—14 R 3 Claims



1. An hydraulic motor powered planetary drive self-propelled irrigation apparatus comprising

a. a water distributing pipe,

b. a plurality of towers supporting said distributing pipe,

c. each tower having a generally triangularly shaped frame including a lower horizontal tubular member supported in a U-shaped flat bottomed open top cross member,

d. hydraulic fluid feed and return lines carried by said frame,

e. a bracket having a flat horizontal top plate fastened to the bottom of the open top cross member and extending laterally beyond said cross member, and a vertically downwardly extending plate depending from the edge of the top plate of the bracket remote from the cross member,

f. a hydraulic motor mounted on said downwardly extending plate of the bracket on the side beneath said cross member, said motor having an output shaft extending through said plate,

g. a gear reducer assembly housed in a rotatable hub casing and mounted on said depending bracket plate on the side opposite the motor, and having an input shaft aligned with the motor shaft, and

h. a wheel mounted on the hub casing and rotatable about an axis aligned with the motor shaft axis, the mounting of the motor and hub casing on opposite sides of the bracket disposing the motor substantially beneath and in line with the frame cross member and disposing the wheel in an offset position laterally of the frame.

3,944,008
INSULATED, TUBE-FRAMED, LAND-TRAVERSING VEHICLE

Alvin Edward Moore, Manini Way, Diamondhead, Bay St. Louis, Miss. 39520

Filed Apr. 22, 1974, Ser. No. 462,734
Int. Cl.² B62D 61/00, 29/00
U.S. Cl. 180—21 24 Claims

1. A vehicle, adapted to travel over land, including:

a body framework comprising: at least one body-bracing frame comprising a plurality of elongated, end-joined angular members forming a general vehicular cross-sectional outline, said angular members having spaces between their angled sides;

a plurality of upright tubular members;

a first set of vehicularly transverse tubular members;

a second set of vehicularly transverse tubular members;

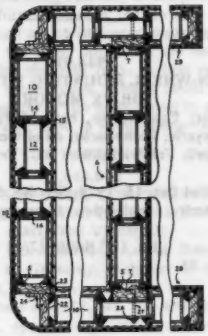
each of said upright and transverse tubular members comprising a plurality of aligned tubes, joint means interconnecting adjacent tubes, and a pair of end elements at opposite ends of said tubular members;

means fastening one group of said end elements of said upright tubular members to first portions of said angular members;

means fastening said end elements of said first set of transverse tubular members to second portions of said angular members;

elongated, tubular-member-bracing means fastening said end elements of said second set of transverse tubular members to portions of said upright tubular members; and

means, connected to said body framework, for facilitating travel over land.

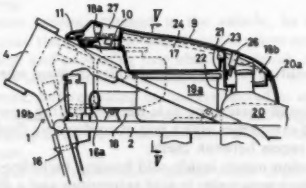


2. A vehicle as set forth in claim 1, in which the said means facilitating travel over land includes: a steerable wheel at a forward portion of the vehicle; and a rear vehicle-driving wheel, in alignment with said steerable wheel in a fore-and-aft, driving axis that is laterally spaced from the central fore-and-aft line of the vehicle.

3,944,009
FRAME ASSEMBLY FOR TWO-WHEELED MOTORIZED VEHICLE

Nagatoshi Katagiri, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1975, Ser. No. 558,711
Claims priority, application Japan, Sept. 10, 1974, 49-103449; Sept. 10, 1974, 49-103450
Int. Cl.² B62K 19/40
U.S. Cl. 180—33 R 8 Claims



1. A parts-housing assembly for a two-wheeled motorized vehicle including at least one enclosed storage area formed thereby, a bifurcated fork element carried by a structural frame member of the vehicle, first and second elongated support elements mounted on opposed sides of said fork element and extending rearwardly therefrom, an operator's seat carried by said frame member to the rear of and spaced from the steering shaft of the vehicle, first and second generally vertically-extending plates supported respectively on said first and second elongated support elements and extending rearwardly from a point adjacent the location where said elongated support members are connected to said fork element, first and second outwardly-shaped side shell housing elements pivotally connected at their lower edges respectively to said first and second elongated support elements defining with said first and second vertically-extending plates first and second side storage chambers respectively, a horizontally-extending cover plate connected at an intermediate elevation between

said first and second vertically extending plates, and an upper shell housing element pivotally connected at the front end thereof to a front portion of said cover plate to form an intermediate chamber defined by said upper shell housing element and the inner walls of said first and second vertically-extending plates.

3,944,010
TRACTION-WHEEL MOUNTING WITH ATTACHED DRIVE MOTOR

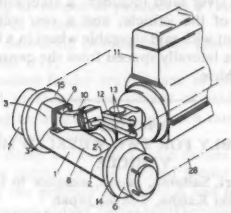
August Winter; Egon Mann, both of Friedrichshafen, and Michael Meyerle, Lochbrucke, all of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Oct. 15, 1974, Ser. No. 514,805

Claims priority, application Germany, Oct. 16, 1973, 2351834

Int. Cl.² B60K *17/08*

U.S. Cl. 180—55 **6 Claims**



1. A mounting for a pair of vehicular traction wheels, comprising:

a horizontally extending axle housing having upwardly enlarged extremities with a pair of confronting cheeks defining a recess between them;

transmission means inside said housing including a pair of planetary-gear trains in said extremities and a differential gearing adjacent one of said planetary-gear trains in one of said extremities, said differential gearing having a gear housing provided with a toothed ring;

a drive motor carried on said one of said extremities within said recess and provided with a substantially horizontal drive shaft at one end and with a peripheral flange axially spaced from said one end, the cheek of said one of said extremities being fastened to said flange and being provided with an aperture through which said one end extends into said one of said extremities together with said drive shaft;

a pinion on said drive shaft meshing with said toothed ring within said one of said extremities;

a pair of wheel hubs adjacent said extremities centered on a horizontal axis which passes through said axle housing below said recess; and

a pair of output shafts, journaled in said extremities in line with said axis, linking said wheel hubs with said planetary-gear trains.

3,944,011
SUPPORTING THE DRIVEN WHEEL HUB OF A MOTOR VEHICLE

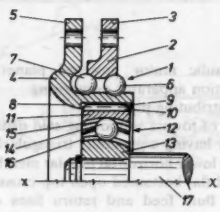
Horst M. Ernst, Eltingshausen; Manfred Brandenstein, Aschfeld, and Armin Olschewski, Schweinfurt, all of Germany, assignors to SKF Industrial Trading and Development Company B.V., Amsterdam, Netherlands

Filed May 31, 1974, Ser. No. 475,191

Claims priority, application Germany, June 9, 1973, 2329554

Int. Cl.² B62D *7/06*

U.S. Cl. 180—70 R **7 Claims**



1. An arrangement for supporting the wheel or the hub of a driven wheel of a motor vehicle on the chassis thereof and for driving the wheel through a rotating axle comprising a homokinetic joint having an inner driving member secured to said axle and an outer driven member, a bearing comprising an outer race ring fixedly secured to said vehicle chassis, an inner race ring secured to said hub for rotation therewith, said inner race ring having a bore, the contiguous surfaces of said bore and of said driven member having mating keyways along their length cooperating to slidably interconnect said respective inner race ring and said driven member for simultaneous conjoint rotary movement and relative axial shifting there along during operation to permit relative axial movement between said bearing and said homokinetic joint.

3,944,012
BRAKE AND ACCELERATOR CONTROLS FOR OPERATING A MOTOR DRIVEN VEHICLE VEHICLE

Arturo A. La Chiusa, Rancho Palos Verdes, Calif., assignor to Auto-Safe Research and Development Corp., Rochester, N.Y.

Continuation of Ser. No. 148,179, May 28, 1971, abandoned, which is a continuation of Ser. No. 826,554, May 21, 1969, abandoned. This application Nov. 9, 1972, Ser. No. 303,517

Int. Cl.² B60K *41/20*

U.S. Cl. 180—77 R **23 Claims**

1. A foot operated control apparatus for operating throttle and brake means of a motor driven vehicle through the operation of a single pedal, said apparatus comprising:

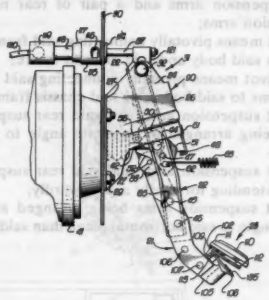
a brake lever and means for mounting said brake lever in a motor driven vehicle in association with the brake means of the vehicle to operate said brake means in response to movement of said brake lever;

an accelerator lever and means for mounting the intermediate portion of said accelerator lever on said brake lever for limited pivotal movement relative thereto;

foot pedal means on said accelerator lever;

means associated with the vehicle throttle means and said accelerator lever for operating said throttle means in response to pivotal movement of said accelerator lever mounted on said brake lever to accelerate and decelerate the motor of said vehicle by movement of said pedal means, concurrent movement of said brake lever and said accelerator lever by said pedal operating to apply or release the brake means of said vehicle; and

urging means, means connecting said urging means with said throttle means and said accelerator lever to raise said pedal relative to said brake lever toward a full open throttle position so that the vehicle operator, by his foot, can control acceleration by governing the raising of said pedal



means due to the actuation of said urging means and thereafter decelerate the vehicle engine toward idling condition and subsequently apply the vehicle brake means through a single continuous depression of said pedal means.

3,944,013

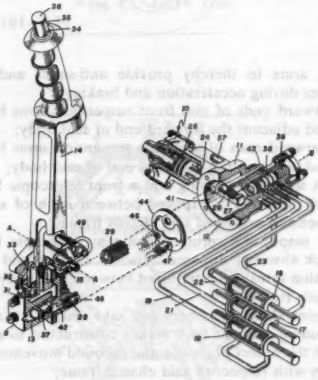
REMOTE SHIFT

Roger F. LaPointe, 13 Wyman St., Worcester, Mass. 01610

Filed Oct. 15, 1974, Ser. No. 514,293

Int. Cl.² B60K *26/02*

U.S. Cl. 180—77 R **6 Claims**



1. Remote shift for use in a vehicle having an engine and a transmission, comprising

a. a housing having a fixed portion and a movable portion,

b. a shift handle pivotally mounted about a first axis on the movable portion of the housing,

c. a plurality of hydraulic motors located at the transmission,

d. a pressure hydraulic line connecting each motor to the housing,

e. a return hydraulic line connecting all of the motors to the housing,

the movable portion of the housing being mounted on the fixed portion of the housing for rotation about a second axis extending at a right angle to the axis of pivotal rotation of the handle, the rotation of the handle about the first axis and the rotation of the handle and the movable portion of the housing causing pressure to appear in the pressure hydraulic lines to operate the hydraulic motors, the fixed portion of the housing having a bore extending at a right angle to the said second axis, a mule piston being slidable in the bore, a piston rod extending coaxially of the piston and having a gear rack formed thereon, the movable portion of the housing having an internal gear engaging an idler gear mounted in the fixed portion of the housing and, in turn, engaging the gear rack, so that rotation of the handle and the movable portion about the said axis causes movement of the mule piston to generate pressure in hydraulic fluid in an actuating circuit.

3,944,014

APPARATUS FOR THE COMPENSATION OF ACCELERATIONS CAUSING LATERAL DEVIATION OF A MOTOR VEHICLE

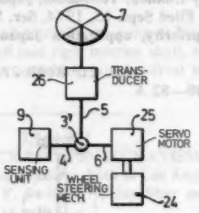
Wolfgang Maisch, Schwieberdingen, and Helmut Domann, Leonberg, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed June 6, 1974, Ser. No. 476,929

Claims priority, application Germany, June 22, 1973, 2331616

Int. Cl.² B62D *5/04*

U.S. Cl. 180—79.1 **2 Claims**



1. An apparatus for the automatic compensation of lateral accelerations acting on a motor vehicle, including a wheel steering mechanism and a manual steering wheel and shaft, comprising:

A. sensor means, attached to the vehicle, to detect and measure the sum of the lateral accelerations acting on the vehicle and producing first electrical signals representative of said lateral accelerations;

B. electric differentiating means connected to receive said first signals and providing second electrical signals corresponding to the first time derivative of said first electrical signals;

C. differential transmission means which is provided with said second electrical signals from said differentiator and with position data from said steering shaft of the motor vehicle and which provides a steering signal for said steering mechanism of the motor vehicle in response to changes in said lateral forces.

3,944,015

RACK AND PINION STEERING GEAR

Arthur E. Bishop, 17 Burton St., Mosman, New South Wales, Australia

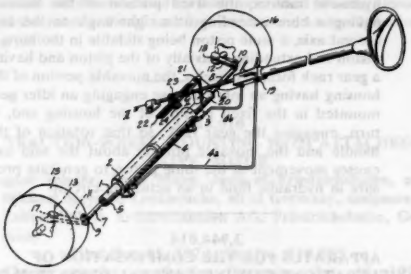
Filed Oct. 26, 1973, Ser. No. 410,114

Int. Cl.² B62D *3/12, 5/10*

U.S. Cl. 180—79.2 R **9 Claims**

1. A steering mechanism for movement of a dirigible wheel, comprising a reciprocal rod member supported in fixed bearings and connected to said wheel for pivotal steering movement of the wheel upon reciprocation of the rod, a manually rotatable steering shaft, a pinion gear rotatable with said shaft, a reciprocal rack gear separate from said rod and driven by

said pinion gear along an axis generally parallel to said rod and means connecting said rack gear to said rod in a generally



longitudinal relation to said rod and for allowing transverse relative movement between said rack and said rod and substantially no longitudinal relative movement therebetween.

3,944,016

LOCKING DEVICE FOR SELECTOR LEVER OF AUTOMATIC TRANSMISSION TO PREVENT CAR DRIVING WITHOUT WEARING SAFETY BELT

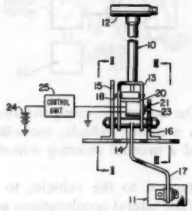
Takahiro Yamamori, Tokyo, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Sept. 13, 1974, Ser. No. 505,543

Claims priority, application Japan, Sept. 29, 1973, 48-108918

Int. Cl.² B60R *21/10*

U.S. Cl. 180—82 A **3 Claims**



1. A device for preventing an automobile automatic transmission from being shifted from one of the neutral and parking positions until a predetermined procedure for safety is carried out, the transmission being provided with a linking lever for range selection thereof and a manual selector lever for moving the linking lever, the device comprising:

a solenoid plunger attached to said selector lever,

a receptacle formed in said linking lever, said linking lever being normally disengaged with said selector lever, and

a control means arranged to cause said plunger to be received in said receptacle when said predetermined procedure is carried out, and thereby connect said linking lever and selector lever together and in which said predetermined procedure is the wearing of a safety belt of a drivers seat.

3,944,017

SUSPENSION FOR TRUCK CAB

Albert W. Foster, Royal Oak, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 23, 1974, Ser. No. 535,926

Int. Cl.² B62D *27/00*

U.S. Cl. 180—89 A **1 Claim**

1. A motor vehicle having a chassis frame, a vehicle body constructed to accommodate a vehicle operator and suspension means operatively interposed between said chassis frame and said body;

said suspension means being constructed to accommodate jounce and rebound of said body relative to said chassis frame;

said suspension means including a pair of front nonextensible suspension arms and a pair of rear nonextensible suspension arms;

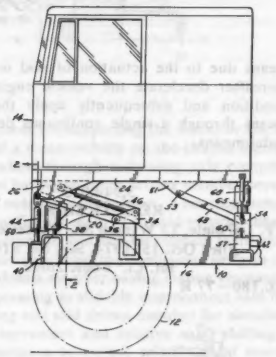
first pivot means pivotally connecting said front suspension arms to said body and said chasssis frame;

second pivot means pivotally connecting said rear suspension arms to said body and said chassis frame;

said front suspension arms and said rear suspension arms each being arranged at an acute angle to a horizontal plane;

said front suspension arms and said rear suspension arms each extending forwardly and upwardly;

said front suspension arms being arranged at a different acute angle to said horizontal plane than said rear suspension arms to thereby provide anti-squat and anti-lift forces during acceleration and braking;



the forward ends of said front suspension arms being disposed adjacent the forward end of said body;

the rearward ends of said rear suspension arms being disposed adjacent the rearward end of said body;

a front suspension spring and a front telescopic hydraulic shock absorber interposed between each of said front suspension arms and said chassis frame;

a rear suspension spring and a rear telescopic hydraulic shock absorber disposed adjacent each of said rear suspension arms and interposed between said body and said chassis frame;

said front shock absorbers and said rear shock absorbers including resilient limit means constructed to resiliently limit the extent of jounce and rebound movement of said body with respect to said chassis frame;

an anti-roll stabilizer bar operatively interconnecting said pair of front suspension arms.

3,944,018

ACOUSTICAL SEAL

Rodney Jene Satory, 1 Wairere Road, Bellmont, Lower Hutt, Wellington, New Zealand

Filed Aug. 1, 1974, Ser. No. 493,548

Int. Cl.² A42B *1/06*

U.S. Cl. 181—33 R **14 Claims**

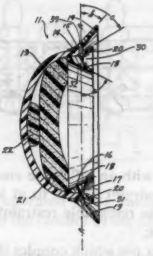
1. An acoustical seal comprising:

an annular base lying generally in a first plane and having an inner and an outer periphery thereon;

a first annular elastomeric lip connected to said inner periphery and extending inwardly and to one side of said

plane at a first acute angle of between 45° and 65° with respect to said plane;

a second annular elastomeric lip connected to said outer periphery and extending outwardly and to said one side of said plane at a second acute angle of between 45° and 65° with respect to said plane;



a third annular elastomeric lip connected to said base between said first and second lips and extending outwardly and to one side of said plane at a third acute angle of between 45° and 65° with respect to said plane; and

annular means attached to said base on the other side of said plane for acoustically sealing said base to a closure member.

3,944,019

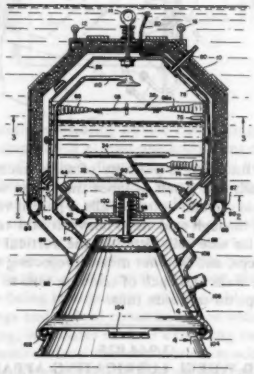
DEEP WATER SOUND IMPLODER

Joseph Pauletich, 91-18 43rd Ave., Elmhurst, N.Y. 11373

Filed June 20, 1974, Ser. No. 481,068

Int. Cl.² G01V *1/04*

U.S. Cl. 181—120 **8 Claims**



1. A deep water sound imploder comprising a boiler, a heat shield disposed about said boiler, and an open ended imploder member suspended from said boiler and supporting said shield, and piping means connecting said boiler to said imploder member for introducing water condensate collected by said member into the boiler and passing steam generated by the boiler into said member.

3,944,020

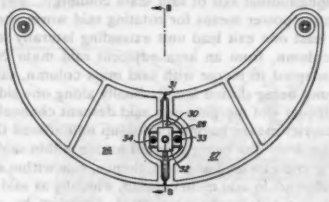
SPEAKER HEADREST FOR MOTOR VEHICLES

Ronald Leroy Brown, 6485 W. 3860 South, Salt Lake City, Utah 84120

Filed July 17, 1974, Ser. No. 489,357

Int. Cl.² G10K *10/00;* **H05K** *5/00;* **H04M** *1/04*

U.S. Cl. 181—141 **10 Claims**



1. A stereo speaker headrest for a vehicle comprising

a rigid interior shell having a pair of side wing members, each having a speaker opening, and a substantially arcuate central front surface,

speaker attachment means for holding a pair of speakers such that each speaker is adjacent a different one of said speaker openings and such that the speakers are displaced laterally from one another, each wing member containing a speaker attachment means,

an acoustical chamber defined by the walls of each wing member,

a padded cover for substantially covering at least the front and rear surfaces of said rigid interior shell, and

attachment means for attaching said headrest to a vehicle seat.

3,944,021

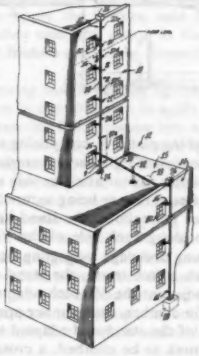
EMERGENCY ESCAPE MECHANISM

Melvin F. Smith, Jr., and Jay Sher, both of Los Angeles, Calif., assignors to Melvin F. Smith, Jr.; Jay Sher and Herbert Brown, part interest to each

Filed Feb. 18, 1975, Ser. No. 550,811

Int. Cl.² B66B *9/00;* **A62B** *1/02*

U.S. Cl. 182—3 **17 Claims**



1. An emergency escape apparatus, which comprises:

a plurality of modular column sections, each of which are axially aligned and mounted essentially contiguous to each other, to form a main column, each of said column sections having a slot along one side, said slots being maintained in a constant alignment whereby said aligned slots form a descent channel within said main column,

said descent channel extending parallel to the longitudinal axis of said main column;

a plurality of modular helical lead screw sections, each of which are axially aligned and mounted, essentially contiguous, to each other, to form a worm shaft, said worm shaft being generally centrally located, and rotatable, within said main column and extending parallel to the longitudinal axis of said main column;

motive power means for rotating said worm shaft;

at least one exit lead unit extending laterally to said main column, from an area adjacent said main column, and adapted to merge with said main column, said exit lead unit being slotted longitudinally along one side to form a feeder slot merging into said descent channel;

a carrier means having a hook-up unit affixed thereto, said hook-up unit being adapted to ride within said feeder slot in said exit lead unit and, thence, ride within said descent channel in said main column, whereby as said worm shaft is rotated in the prescribed direction by said motive power means, said hook-up unit, while engaged in said descent channel, slides along the shoulders of said rotating worm shaft and thereby descends longitudinally within said descent channel, said rate of longitudinal movement of said hook-up unit thus being indirectly prescribed and governed by said motive power means; and

an escapee support means connected to one end of said carrier means, said escape support means to be secured to a potential escapee, whereby as said hook-up unit descends in said descent channel, said escapee support means descends toward the bottom of said descent channel.

3,944,022

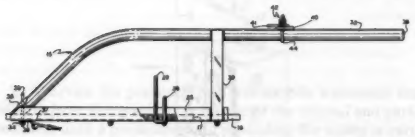
TREE CLIMBING STAND

Joseph W. Ming, Hardscrabble Road, Cassville, N.Y. 13318

Filed May 9, 1975, Ser. No. 576,088

Int. Cl.² A47C 9/10

U.S. Cl. 182—20 **8 Claims**



1. A tree-climbing platform comprising a substantially rectangular stand portion of rigid sheet material having a V-notch at one end, a tubular runner at either side of the platform, the main portions of each runner being secured to the stand parallel to and spaced thereabove, the stand having a metal plate secured thereto along each side of the V-notch, each plate having teeth along one edge projecting beyond the stand for engagement with a tree trunk, the stand having stirrups secured thereto adjacent the V-notch adapted for engagement with the feet of a climber, each runner projecting beyond the V-notched end of the stand and adapted to extend on either side of a tree trunk to be climbed, a crossbar removably secured at each end to a runner, the crossbar having a metal plate secured thereto at its center, the crossbar plate having teeth along one edge projecting from the crossbar and adapted to contact the tree trunk on the side opposite that contacted by the V-notch plates teeth, whereby a climber may embrace a tree with his arms while bending his knees to raise the platform and then put his weight on the platform to reengage the platform with the tree and thereafter grasp the tree at a higher level for again raising the platform.

3,944,023

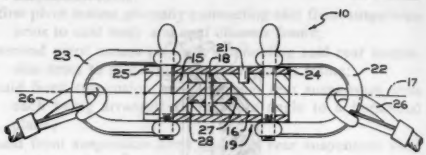
RELEASABLE RESTRAINT IN AN INFLATABLE EMERGENCY EVACUATION SLIDE

John M. Fisher, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 7, 1975, Ser. No. 556,101

Int. Cl.² A62D 1/20

U.S. Cl. 182—48 **11 Claims**



1. In combination with an inflatable emergency evacuation slide, a releasable restraint joined to at least one portion of said slide, wherein the releasable restraint comprises:

a. two components;

b. at least one shear pin which couples the two components; and

c. a sleeve-like covering:

1. inseparably affixed to one component; and

2. enclosing the at least one shear pin such that the at least one shear pin is essentially inaccessible.

3,944,024

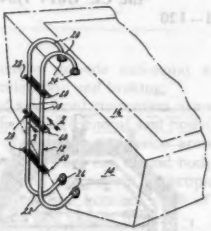
LADDER

Charles L. Adas, St. Clair Shores, Mich., assignor to Detroit Marine Engineering, Detroit, Mich.

Filed Feb. 6, 1975, Ser. No. 547,572

Int. Cl.² E06C 7/08, 9/02

U.S. Cl. 182—194 **6 Claims**



1. A ladder including a plurality of steps each having top and bottom walls and a pair of inner transverse walls extending between said top and bottom walls, a pair of vertical openings extending through said steps between said vertical walls, a pair of tubular side rails fitted in the vertical openings of each of said steps, and fastener means projecting through said step transverse walls and each of said side rails to support and locate said steps on said side rails.

3,944,025

FLANGED WHEEL LUBRICATING APPARATUS

Albert E. Owen, Portland, Oreg., assignor to Electronic Flange Lubricators, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 404,235, Oct. 9, 1973, abandoned. This application Sept. 9, 1974, Ser. No. 486,404

Int. Cl.² B61K 3/00

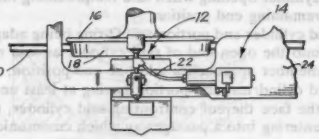
U.S. Cl. 184—3 R **15 Claims**

1. In flanged wheel lubricating apparatus comprising a lubricant applicator unit adapted to discharge lubricant on the flange of the wheel, a lubricant drive unit providing a source of lubricant under pressure, and conduit means interconnect-

ing the applicator and drive units, a lubricant drive unit comprising:

a. a cylinder adapted to contain lubricant and having a port communicating with the conduit means and fitted with screw-driven piston means behind the lubricant,

b. ratchet-driven gear wheel means arranged in driving connection to the screw of the screw-driven piston means, and



c. electrically operated drive means arranged in driving connection to the ratchet of the ratchet-driven gear wheel means,

d. the drive means comprising an electric circuit, an electric solenoid in the circuit fitted with a clapper and including crank means interconnecting the clapper and the ratchet of the ratchet-driven gear wheel means, and electric timing means in the circuit for energizing the solenoid at predetermined intervals.

3,944,026

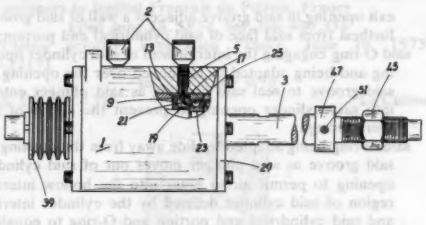
SPINDLE LUBRICATING DEVICE

Arthur J. Rhodes, 2601 Benoch Ave., Louisville, Ky. 40216

Filed June 23, 1975, Ser. No. 589,132

Int. Cl.² F16N *29/00*

U.S. Cl. 184—7 A **4 Claims**



1. A spindle lubricating device comprising:

a. a housing having at least one lubricating opening therein;

b. a pair of bearings disposed within said housing, the outer periphery of said bearings being in movable contact with an inner surface of said housing;

c. a pair of lubricating collars, each of said collars being of approximately the same outer diameter as said bearings and juxtaposed thereto, said collars having an outer and inner surface with a cavity disposed therebetween, said cavity being in alignment with movable members of said bearings and in fluid communication with said lubricating opening, said outer surface extending outwardly beyond said inner surface whereby lubricants added through said lubricating opening flow through said cavity and onto said movable members of said bearings;

d. a spindle co-axially aligned with and disposed through and in contact with the inner surface of said bearings; and,

e. means for driving said spindle,

f. a sleeve which is disposed between and which receives said lubricating collars at each end thereof, said sleeve having a pair of openings therein, each opening being in alignment with said cavity in said lubricating collars and said lubricating openings in said housing.

3,944,027

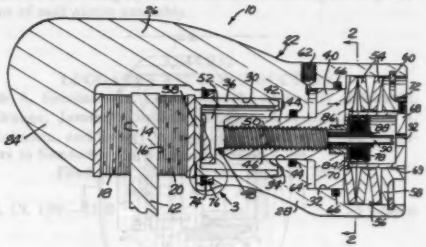
FAIL-SAFE DISC BRAKE WITH A CLEARANCE-TAKEUP MECHANISM

Mayjue A. Yamamoto, San Bernardino, Calif., assignor to Daniel G. Durfee, San Bernardino, Calif.

Filed May 30, 1974, Ser. No. 474,360

Int. Cl.² F16D *55/224, 65/56*

U.S. Cl. 188—71.9 **2 Claims**



1. A spring-actuated, hydraulically-released, fail-safe disc brake comprising, in combination:

a rotatable disc having friction faces on opposite sides thereof;

a pair of friction pads disposed with one pad adjacent each of said friction faces;

a caliper housing operably connected to each of said friction pads for urging the same into braking engagement with their respective friction faces when the brake is actuated, said caliper housing having a pair of axially aligned cylinder bores provided therein;

a cylindrical aperture connecting said cylinder bores along the axis thereof;

a first piston slidably disposed within one of said cylinder bores and having an end portion bearing against the adjacent friction pad;

a second piston slidably disposed within the other cylinder bore, said second piston having extension means thereon passing through said aperture into said one cylinder bore;

a clearance-takeup member having a threaded connection with said extension means on said second piston; said member having an end portion abutting against said first piston so that when said second piston is urged in the direction to apply the brakes, said clearance-takeup member pushes said first piston in the same direction, causing said friction pads to be pressed against said friction surface;

compression spring means bearing against one side of said second piston in one direction to apply the brakes;

means for introducing fluid pressure into said other cylinder bore on the side of said second piston opposite said compression spring means, said fluid pressure being operable to move said second piston in the other direction against the resistance of said compression spring means, thereby releasing the pressure of said spring means against said second piston so as to release the brakes;

means frictionally engaging said first piston for retracting the same a predetermined small distance from its respective friction pad when fluid pressure acts against said second piston, so as to open up a minimum running clearance between the friction pads and said friction faces on said disc; and

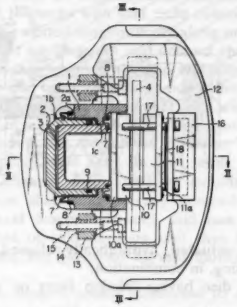
torsional spring means connected between said second piston and said clearance-takeup member so as to exert torque in one direction against said second piston and in the other direction against said clearance-takeup member to turn the latter in the direction to cause it to be extended with respect to the second piston whenever there is any clearance between said end portion of the clearance-takeup member and said first piston when the brake is released.

3,944,028

DISC BRAKE AND ACTUATOR ASSEMBLY STRUCTURE

Tetsuo Haraikawa, Funabashi, Japan, assignor to Tokico Ltd., Japan

Filed Aug. 12, 1974, Ser. No. 496,857
Claims priority, application Japan, Aug. 20, 1973, 48-93143
Int. Cl.² F16D 55/228
U.S. Cl. 188—72.5 4 Claims



1. A disk brake comprising:
a housing affixed to a non-rotatable member and having a through-hole therein;
said through-hole having a large diameter portion and small diameter portion, said large diameter portion being of a greater length than said small diameter portion;
a cylinder slidingly fitted in the large diameter portion of said through-hole and having a pressure fluid inlet;
a piston having an outer surface of uniform diameter throughout the length thereof fitted within and in sliding contact with said cylinder and said small diameter portion of said through-hole;
said cylinder and piston defining therebetween single chamber means for receiving fluid through said inlet and for moving said cylinder and piston longitudinally with respect to each other;
a disk rotatable together with a rotating member;
a yoke affixed to said cylinder and movable with said cylinder;
means for coupling said yoke to said housing in a movable manner;
a first friction pad supported by said yoke and adapted to be urged against or detached from a first side of said disk; and
a second friction pad mounted on one end of said piston and adapted to be urged against or detached from a second side of said disk.

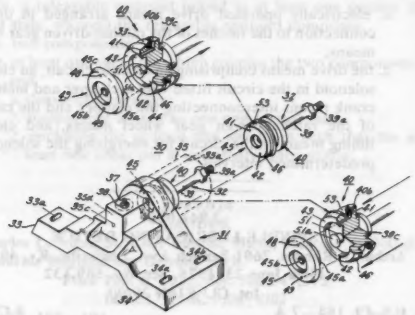
3,944,029

DAMPER FOR PRINTING AND THE LIKE

Masao Jozuka, Nagoya, Japan, assignor to Centronics Data Computer Corporation, Hudson, N.H.

Filed Nov. 22, 1974, Ser. No. 526,419
Int. Cl.² F16F 9/50
U.S. Cl. 188—282 6 Claims

1. Means for providing one-way dampening action for a member reciprocating between two end positions, comprising:
a plunger assembly;
a cylinder assembly;
one of said assemblies being mounted adjacent one end position and the other assembly being secured to said reciprocating member;
said cylinder assembly having a cylinder opening co-axially aligned with said plunger assembly;
said plunger assembly having a cylindrical shaped end portion provided with a continuous annular groove about its periphery and having a face;
a resilient compliant O-ring being positioned within said groove, the diameter of the O-ring cross-section being less than the width of said groove to permit said O-ring to move along said groove;
the outer periphery of said O-ring being adapted to engage said cylinder opening;
said plunger assembly being completely removed from said cylinder opening when said reciprocating member is at a remaining end position;
said cylinder end portion and O-ring being adapted to enter into the open end of said cylinder as said reciprocating member approaches said one end position;
said cylindrical end portion having at least one opening in the face thereof confronting said cylinder, said opening entering into a passageway which communicates with an



exit opening in said groove adjacent a wall of said groove furthest from said face of said cylindrical end portion;
said O-ring engaging the interior wall of said cylinder opening and being adapted to be moved over the opening in said groove to seal said opening as said plunger enters into said cylinder opening to prevent the egress of air therethrough;
said O-ring being adapted to slide away from the opening in said groove as said plunger moves out of said cylinder opening to permit air to enter into the hollow interior region of said cylinder defined by the cylinder interior and said cylindrical end portion and O-ring to equalize the pressure on the opposite sides of said cylinder, thereby providing a dampening action for said reciprocating meamber as said plunger enters into said cylinder opening and further facilitating rapid removal of said plunger and rapid acceleration of said reciprocating member as said plunger moves out of said cylinder.

3,944,030

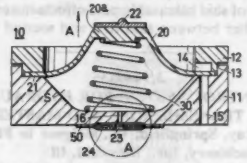
PNEUMATIC TIME-LIMITING DEVICE

Eisuke Yokoyama, Musashino, Japan, assignor to Kawaguchiko Seismitsu Co., Ltd., Japan

Filed July 9, 1974, Ser. No. 487,207
Claims priority, application Japan, July 11, 1973, 48-77435
Int. Cl.² F16F 9/04
U.S. Cl. 188—298 2 Claims

1. A mechano-pneumatic timer device, comprising a vessel having a bottom wall, a membrane piston having a skirt, said skirt being fixedly attached to said vessel for defining jointly with the vessel a variable volume chamber, spring means cooperable with the piston and vessel for urging said piston in its expanding direction, a check valve cooperating with said piston for evacuating air from said chamber to outside open atmosphere when said piston is contracted, the bottom wall of the vessel having a passage for supplementing air drawn from

the open atmosphere to said chamber when negative pressure prevails in the chamber by virtue of expanding movement of said piston for performing a predetermined time-limiting operation of the timer, and means cooperating with said passage for allowing a limited flow rate of the air drawn by said piston, said cooperating means including a main body of pervious material closing the passage in the bottom wall of the vessel, said body having upper and lower surfaces, a non-pervious layer secured to the upper surface of the main body, and



non-pervious means engaging the lower surface of the main body and secured to the bottom wall of the vessel for fixedly attaching the main body to the bottom wall, said non-pervious means having at least one air passage therein in communication with the lower surface of the main body so that upon negative pressure being created within the chamber, air will be drawn from said one air passage outwardly through the main body and thence inwardly between the bottom wall of the vessel and the non-pervious layer of the main body through the passage and into the chamber.

3,944,031

SHOCK ABSORBER

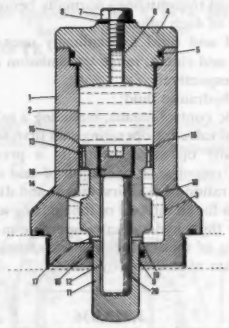
Jacques Cholet, Rueil-Malmaison; Jean Laurent, St. Germain-en-Laye, and Pierre Magneville, Vernouillet, all of France, assignors to Institut Francais du Petrole, France

Filed June 18, 1974, Ser. No. 480,374

Claims priority, application France, June 18, 1973, 73.22171

Int. Cl.[2] F16F 9/18

U.S. Cl. 188—317 **12 Claims**



1. A shock absorber comprising a casing of a pressure-withstanding material, said casing having an inner wall defining at least a first and a second recess in communication with each other, said first recess having a smaller cross-section than that of said second recess, and each of said first and second recesses being substantially filled with fluid; a piston assembly being displaceable in opposite directions within said casing, said piston assembly comprising a rod extending slidably through an orifice through said inner wall of said casing, a first piston integral with said rod and having at least one orifice for communicating opposite sides of said first piston, and a second piston integral with said rod and disposed between said first piston and said orifice through said inner wall, said first piston having a cross-section larger than that of said second piston with said first piston slidably engaging the inner wall defining said first recess along the entire displacement of said piston assembly, and said second piston having a cross-section slightly smaller than that of said first recess and being guided past the inner wall defining said first recess only during a portion of the entire displacement of said piston assembly; and means for absorbing a portion of said fluid during the displacement of said piston assembly.

3,944,032

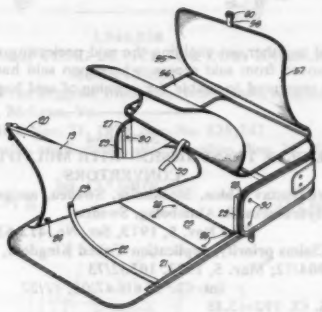
LUGGAGE CASE CONSTRUCTION

Clair A. Samhammer, Laguna Beach; Arthur W. Ellsworth, Orange; James P. Sullivan, Tustin, all of Calif.; John A. Artmann, and Robert A. Null, both of Denver, Colo., assignors to Samsonite Corporation, Denver, Colo.

Filed Mar. 20, 1974, Ser. No. 452,756

Int. Cl.[2] A45C 3/00

U.S. Cl. 190—41 B **16 Claims**



1. A luggage case, comprising:

a rigid C-shaped member including an elongated top panel and a pair of relatively short end panels extending at substantially ninety degrees from the respective ends of said top panel;

a flexible sheetlike member wrappingly enclosing the open sides of said C-shaped member having peripheral edges which are coextensive with the C-shaped member peripheral edges; and

zipper closure means extending continuously along said sheetlike member peripheral edges in a close path and continuously along the peripheral edges of said C-shaped member, said zipper means coacting for releasably securing said flexible sheetlike member to said rigid one-piece member.

3,944,033

BAG HANDLE

Earl G. Simson, 1140 Webster Ave., New Rochell, N.Y. 10804

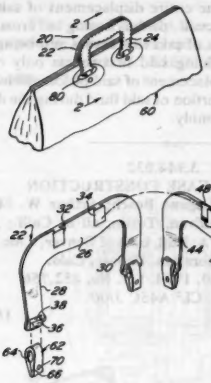
Filed Oct. 29, 1974, Ser. No. 518,311

Int. Cl.[2] A45C 13/26

U.S. Cl. 190—57 **5 Claims**

1. In combination with a bag having a pair of side walls capable of being opened and closed a bag handle comprising a pair of U-shaped handle elements, each of said elements including a gripping section which bridges a pair of leg members, both of said leg members of one of said handle elements being pivotable secured to one side wall of said bag, and both of said leg members of the other of said handle elements being pivotably secured to the other side wall of said bag, one of said handle elements including at least one dove-tailed projecting member which extends transversely along the inside surface of the gripping section, the other of said handle elements include at least one recess for temporarily receiving said dovetailed

projecting member so that when said projecting member is received in said recess said handle elements are temporarily



held together yet enabling the said projecting member to be removed from said recess, whereupon said handle elements are separated to enable the opening of said bag.

3,944,034

VEHICLE TRANSMISSION WITH MULTIPLE TORQUE CONVERTORS

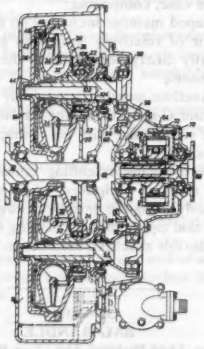
Karl Gustav Ahlen, Stockholm, Sweden, assignor to S.R.M. Hydromekanik Aktiebolag, Sweden

Filed Nov. 5, 1973, Ser. No. 412,638

Claims priority, application United Kingdom, Nov. 3, 1972, 50904/72; Mar. 5, 1973, 10532/73

Int. Cl.² F16H *47/08*, *41/22*

U.S. Cl. 192—3.25 **26 Claims**



1. A hydrodynamic torque converter transmission comprising at least two hydrodynamic torque converter units connected in parallel between a main input shaft and a main output shaft, each torque converter including an input drive means in the form of a rotating casing drivingly connected to said main input shaft and forming therein a working chamber having therein a pump part including at least one ring of pump blades and a turbine part including at least one ring of turbine blades, output drive means including an output drive shaft drivingly engaged with the said main output shaft, first connecting means for engaging the pump part with the said rotating casing for rotation therewith, second connecting means for connecting the turbine part with the output drive means for rotation therewith, wherein in at least one of said torque converters, one of said first and second connecting means is completely releasable so that the part engaged thereat including all blades of that part, upon being released, is completely released so as to be rotatable relative to its respective said drive means, one of said releasable part and its drive means being a movable member movable axially relative to the other between a first position at which the connecting means connects that part to its respective drive means and a second position at which the connecting means is released, servomotor means for moving the movable member between said first and second positions, the releasable part being the piston of said servomotor such that a fluid pressure differential on opposite sides of said releasable part effects movement of said movable member between said first and second positions.

3,944,035

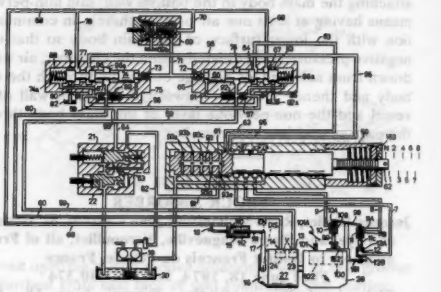
FLUID CONTROL SYSTEM FOR HYDRAULICALLY OPERATED TRANSMISSIONS AND MASTER CLUTCH

Ferris L. McRay, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Oct. 16, 1974, Ser. No. 515,315

Int. Cl.² B60K *21/00*

U.S. Cl. 192—3.57 **10 Claims**



9. In combination:

a power train comprising a normally engaged clutch, a high and low range transmission and a multispeed main transmission, said transmissions normally being shiftable independently of each other;

first, second and third hydraulically operable means for operating said clutch, range transmission and main transmission, respectively;

a source of hydraulic fluid;

and hydraulic control means, including a selectively operable control valve for operating said first, second and third hydraulically operable means in a predetermined sequence in response to operation of said control valve to effect operation of said first means and disengagement of said clutch for an interval of time during which either said second or third hydraulically operable means are effecting shifting of their respective transmissions in response to operation of said control valve.

3,944,036

CLUTCH WITH PISTON MODULATING VALVE

Vladimir Alexeevich Koshelev, ulitsa Zverinetskaya, 14, kv. 46, Moscow, U.S.S.R.

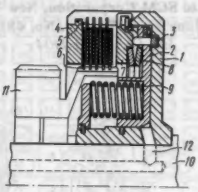
Filed Mar. 31, 1975, Ser. No. 563,305

Int. Cl.² F16D *25/00*

U.S. Cl. 192—109 F **4 Claims**

1. A multi-disc hydraulically operated friction clutch, comprising: a housing; sets of driving and driven discs alternatingly mounted in said housing for engagement and disengagement; a central shaft operatively connected with one of said sets of said discs, while the other said set is operatively connected with said housing; a plunger axially movable in said housing; a pressure disc mounted in said housing for operative interac-

tion with said sets of discs; intermediate spring means normally urging said pressure disc from said plunger; hydraulic power means adapted to supply pressurized working fluid beneath said plunger and to displace it axially against the effort of said intermediate spring means, for said plunger to displace said pressure disc, so that the latter should compress said sets of discs to effect engagement of the clutch; controllable valve means positioned in through-going openings in said plunger adjacent to the periphery thereof and adapted for cooperation with said pressure disc, on the one hand, and with said housing, on the other hand, upon axial displacement of said plunger and said pressure disc; said valve means normally



closing said openings in said plunger with the clutch disengaged and with the plunger moving through an idle stroke and opening said openings for draining of the working fluid therethrough in accordance with a characteristic predetermined by the shape of said valve means, in proportion with the relative displacement of said plunger and said pressure disc, so that the closer said plunger and said pressure disc are brought together, the greater is the degree to which the state of the valve means and the flow capacity thereof is altered: resilient return means connected with said plunger for returning same into the initial position thereof upon discontinuation of the action thereupon of said hydraulic power means at disengagement of the clutch.

3,944,037

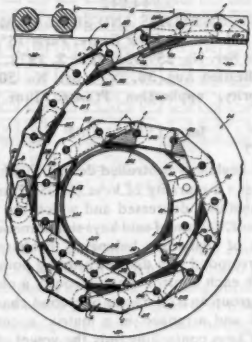
RAIL STRUCTURE FOR A CONVEYOR

Ralph E. Stease, 8921 Cavalier Drive, Cincinnati, Ohio 45231

Division of Ser. No. 381,788, July 23, 1973, Pat. No. 3,876,060. This application July 5, 1974, Ser. No. 485,932

Int. Cl.² B65G *13/00*

U.S. Cl. 193—35 TE **7 Claims**



1. A link type rail structure for a conveyor device, said structure comprising

a plurality of support links with each of said support links being of a U-shaped cross-sectional configuration, said U-shaped configuration being defined by a pair of opposing vertical side walls and a horizontal lip connected between said side walls along the bottom edges thereof,

a connecting link interposed between successive support links, opposite ends of each of said connecting links being pivotally connected to an adjacent end of a support link and being positioned between said side walls of that support link, each connecting link providing a foot portion at each end thereof adapted to contact an associated support link's lip to establish said links in a straight in-line attitude and an offset portion at each end thereof adapted to contact a transverse edge of said lip to establish said links in a curved line attitude, and each end of each connecting link beyond the pivotal connection of that link with its adjacent support links being configured such that same is confined between the side walls of said adjacent support links as said rail structure is translated between the rigid in-line attitude and the curved line attitude, thereby aiding in the elimination of pinch points between successive links of said rail structure, and

means adapted to mount a plurality of one of rollers and skate wheels to said rail structure.

3,944,038

ENERGY DISSIPATING DEVICE FOR COIN HANDLING MECHANISMS

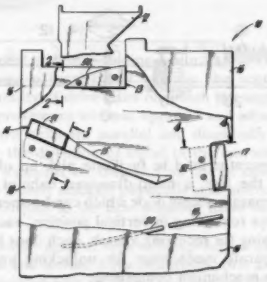
Wilhelm Aart van Zeggern, Bleiswijk, Netherlands, assignor to Mars, Inc., McLean, Va.

Filed Nov. 21, 1974, Ser. No. 525,742

Claims priority, application United Kingdom, Nov. 22, 1973, 54318/73

Int. Cl.² G07F *3/02*

U.S. Cl. 194—1 K **15 Claims**



1. A coin handling mechanism including means defining a coin path through the mechanism, the means including at least one energy dissipating device arranged to be struck by a coin travelling along the path and cause a change in direction of the path, the energy dissipating device comprising a rigidly mounted solid piece of material having a hardness value greater than 9 on the Mohs scale.

3,944,039

CONSUMABLE CARD ACTIVATED APPARATUS

John J. Houghtaling, 6080 SW. 104th St., Miami, Fla. 33156

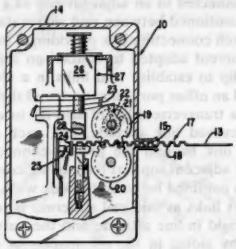
Filed June 21, 1974, Ser. No. 481,664

Int. Cl.² G07F *7/08*

U.S. Cl. 194—4 R **5 Claims**

1. In a card-operated device for activating an apparatus, the combination including a housing having an insert slot for receiving a card with a consumable portion which is crimped and extends longitudinally along an edge of the card and is subdivided into a plurality of units, gate means within said housing normally blocking the insertion of a card therein to an operative position, means responsive to a portion of said consumable portion for opening said gate means to permit

insertion of said card, gear means having play between the meshing teeth corresponding to the thickness of the crimped portion of the card responsive to an unconsumed part of said consumable portion to provide a signal for activating said



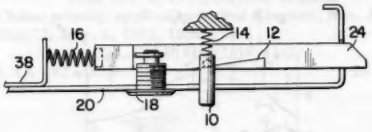
apparatus, and means responsive to said consumable portion for cancelling one of said units each operation, whereby said card can only be used the number of times corresponding to the remaining number of units on said consumable portion.

3,944,040

APPARATUS FOR FACILITATING PICK UP OF DRY CLEANING

Laurie Richard, Don Mills, Canada, assignor to Raymond Lee Organization Inc.; a part interest

Filed June 20, 1974, Ser. No. 481,247
Int. Cl.² G07F 5/26
U.S. Cl. 194—65 **2 Claims**



1. In apparatus used to facilitate pick up of dry cleaning, wash and the like, a multi-drawered cabinet, each drawer having a separate access door which can be opened and closed while always remaining in vertical position, each door having a side opening for receiving a latch, each door being provided with a separate mechanism for unlocking and locking the door, each mechanism comprising:

a horizontally elongated latch which can be moved horizontally forward to engage the corresponding side opening to lock the corresponding door and which can be moved horizontally rearward to be withdrawn from said side opening to unlock said door;

spring means bearing against the latch to normally bias the latch into forward position;

a horizontal shaft rotatable about its axis and extending past the latch at right angles thereto;

a vertical cam on said shaft which is pivoted about the shaft in a vertical plane when the shaft rotates;

a check on the latch disposed on one side of the cam;

stop pins disposed on both sides of the cam and spaced therefrom;

a cam wedge on the latch;

a push-button device having a cam follower cooperating with the wedge, said device including a button spring loaded biased into a normally extended position, said button having a compressed position when manual pressure on the button overcomes the spring bias thereon, said follower bearing against the wedge surface when the button is in extended position and being spaced from the wedge surface when the button is in compressed position; and

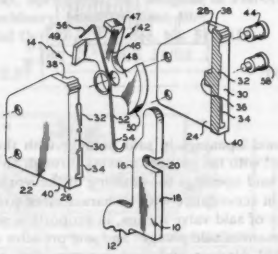
handle means manually operable and secured to the shaft for rotating the shaft in one direction until the cam bears against the check and moves the latch rearward against the bias of the spring means until the cam bears against one pin to withdraw the latch from the side opening, said handle means rotating the shaft in the opposite direction until the cam bears against the other pin and no longer overcomes the bias of the spring means.

3,944,041

CHANGEABLE TYPE

Hans W. Mueller, and Cornel L. Lamey, both of Cortland, N.Y., assignors to SCM Corporation, New York, N.Y.

Filed June 21, 1974, Ser. No. 481,605
Int. Cl.² B41J 1/04
U.S. Cl. 197—36 **14 Claims**



1. An improved changeable type element for mounting on the free end of a typebar, the type element having a pair of walls spaced from one another by a connecting type face wall defining a U-shaped type element, the improvement comprising:

a. a pivot member supported on the type element;

b. a first means supported on said pivot member for selectively and progressively wedging against said typebar when said element is mounted on the typebar; and

c. a second means separate from said first means and operatively engaging said first means for biasing said first means into progressive wedging engagement with the typebar thereby compensating for wear on said first means.

3,944,042

SYLLABIC TYPEWRITERS AND SIMILAR MACHINES

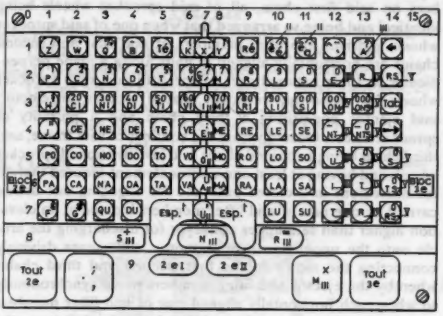
Jean Gremillet, 64 Avenue Felix Faure, Paris 15°, France

Continuation of Ser. No. 259,051, June 2, 1972, abandoned. This application Aug. 30, 1974, Ser. No. 502,188
Claims priority, application France, June 21, 1971, 71.22540
Int. Cl.² B41J 3/02
U.S. Cl. 197—7 **11 Claims**

1. A syllabic-keyboard controlled device, in which the keyboard comprises : a plurality of keys (FIGS. 7 and 8) which can be simultaneously depressed and which are arranged in rows and columns, certain of said keys simultaneously controlling a plurality of characters belonging to character groups which each correspond to a distinct printing point; certain of said keys which each control simultaneously a character of a first character group an a character of second character group being disposed and arranged in a matrix; a central key in certain rows of keys controlling only the vowel of the second character group which corresponds to the other keys of the matrix in the same row; the keyboard comprising the following improvements:

in several rows of the matrix, two keys adjacent the central key control a character of a third character group which is the same for the two keys; two space keys the width of

which is about that of two columns of the matrix and the length of which is at least equal to that of three rows of the matrix; said space keys being disposed forwardly of said matrix and being spaced laterally from one another on opposite sides of the center of the keyboard and three sets of thumb-operated keys which are elongate in the sense of the rows of the matrix, the width of said thumb-operated keys being approximately twice that of a matrix



key, each of said sets comprising three keys situated respectively in three rows, one set of three keys being between the two space keys, a second set to the left of the left space key, and the third set at the right of the right space key, all of these thumb-operated keys adjacent to the space keys being in the same plane as said space keys, so that a thumb of an operator can depress each of these thumb-operated keys, either alone or at the same time as an adjacent space key.

3,944,043

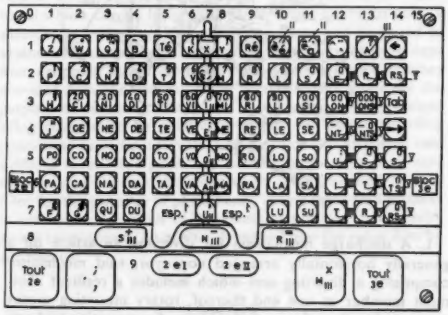
SHIFT MECHANISM IN SYLLABIC TYPEWRITERS

Jean Gremillet, 64 Avenue Felix Faure, Paris 15°, France

Division of Ser. No. 259,051, June 2, 1972, which is a continuation of Ser. No. 502,188, Aug. 30, 1974. This application Aug. 30, 1974, Ser. No. 502,190

Int. Cl.² B41J *11/14, 3/00*

U.S. Cl. 197—72 **3 Claims**



3. A syllabic keyboard controlled device comprising a carriage cylinder, a plurality of type bars arranged in groups each of which corresponds to a distinct printing point, a plurality of sectors each of which pivotally supports at one end the type bars of a respective group, said type bars having heads at their other ends, each of said type bars having characters arranged on its head at different levels or cases, means for mounting certain of said sectors for movement independently of others for case shifting to print characters of different case, thin guide sheets fixed to each of said sectors at lateral extremities thereof, cushions fixed to and supported by said thin sheets in position to support heads of the type bars of the respective group of type bars when in rest position, there being two of said thin sheets between adjacent type bar groups the supporting sectors of which are independently movable relative to one another for case shifting and one of said thin sheets between adjacent groups of type bars which are movable together for case shifting, said thin sheets being continuous from said cushions up to near said carriage cylinder and being situated between the paths of movement of type bars belonging to adjacent type bar groups to constitute guides for said type bars in their printing movement from said cushions to said carriage cylinder.

3,944,044

VARIABLE SPEED TRANSPORT SYSTEM

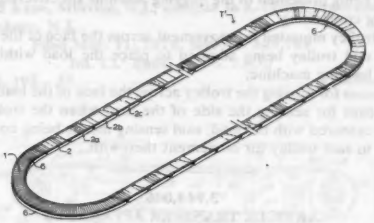
Norbert Hamy, Beaconsfield, Canada, assignor to Tebron Holdings Ltd., Beaconsfield, Canada

Filed Jan. 9, 1974, Ser. No. 431,982

Claims priority, application United Kingdom, Jan. 10, 1973, 1316/73

Int. Cl.² B65G *17/00;* **B61B** *13/14*

U.S. Cl. 198—16 MS **19 Claims**



1. In a transport system including a plurality of carrier belt segments forming a carrier belt wherein the segments are driven by a plurality of drive belts on which the segments are placed, the improvement wherein opposed and adjacent ends of adjacent drive belts are parallel and diagonally disposed with respect to the direction of travel of the carrier belt segments and the segments are disposed on one of said adjacent drive belts in a loosely stacked physically non-interconnected arrangement and pass to the next adjacent drive belt in such arrangement.

2. A closed loop transport system comprising a carrier belt and at least first and second drive assemblies, first and second drive belts associated with said first and second drive assemblies respectively, said first drive assembly driving said first drive belt at a linear rotational speed higher than a linear rotational speed which said second drive assembly drives said second drive belt, said carrier belt being formed of a plurality of discrete rigid carrier belt segments, placed on said first and second drive belts in a loosely stacked physically non-interconnected configuration, each of said carrier belt segments having lower surfaces disposed upon and in contact with said drive belts and being vertically supported thereby, each of said carrier belt segments contacting adjacent segments, each of said carrier belt segments having at least one abutment portion thereon projecting toward a next adjacent carrier belt segment and each carrier belt segment having a shoulder forming surface opposite to said abutment portion and located to be contacted by the abutment portion of an adjacent carrier belt segment so that each segment receives horizontal support by the next adjacent segment, said carrier belt segments sliding along each other through said abutment portions in sliding contact with the shoulder forming surfaces when passing from said first drive belt to said second drive belt such that each of said carrier belt segments has a greater inclination with respect to a perpendicular plane passing through the drive belts when on said first drive belt than when being supported by said second drive belt.

3,944,045

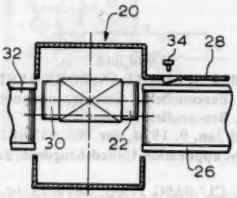
DEVICE FOR CENTERING A LOAD IN A BAGGING MACHINE

David M. Higgins, Chicago, Ill., assignor to Comptex, Inc., Chicago, Ill.

Division of Ser. No. 393,588, Aug. 31, 1973, abandoned. This application Sept. 24, 1974, Ser. No. 508,876

Int. Cl.[2] B23Q 7/00

U.S. Cl. 198—19 6 Claims



1. A centering device in a bagging machine for centering load being presented to the bagging machine for covering with a bag comprising:

a trolley mounted for movement across the face of the load, said trolley being adapted to place the load within the bagging machine;

means for moving the trolley across the face of the load; and

means for sensing the side of the load when the trolley is centered with the load, said sensing means being coupled to said trolley for movement therewith.

3,944,046

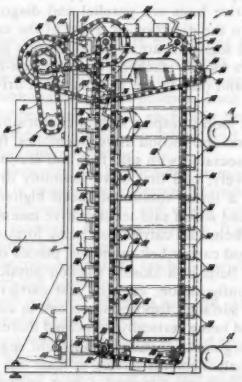
ARTICLE TRANSFER APPARATUS

Edward A. Kubicek, Greentown, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 19, 1974, Ser. No. 443,602

Int. Cl.[2] B65G 47/42

U.S. Cl. 198—21 3 Claims



1. In combination with a pair of horizontal conveyors with one conveyor being located above the other conveyor, apparatus for transferring articles from the lower horizontal conveyor to the upper horizontal conveyor, said apparatus being positioned to one side of said conveyors and comprising an upstanding relatively narrow frame supporting an elevator device having first and second horizontally spaced sprocket wheels located adjacent the upper conveyor, third and fourth horizontally spaced sprocket wheels located adjacent the lower conveyor, the first and third sprocket wheels being vertically aligned, fifth and sixth sprocket wheels rigidly connected to and axially aligned with the first and third sprocket wheels respectively, a first chain entrained about said first, second, third, and fourth sprocket wheels and having a plurality of lifter members uniformly spaced a predetermined distance from each other and connected to the first chain along the length thereof, a second chain entrained about said fifth and sixth sprocket wheels and having a plurality of lifter members connected thereto that are uniformly spaced at distances equal to the predetermined distance between the lifter members on said first chain, all of said sprocket wheels being identical and being so arranged that when one of said sprocket wheels is driven the lifter members of said first and second chains are horizontally aligned in pairs along a plane perpendicular to the rotational axes of the fifth and sixth sprocket wheels for supporting vertically spaced articles, an ejector, said ejector comprising a third chain and a plurality of sprocket wheels located within the confines of said frame, said third chain being entrained about said last mentioned sprocket wheels and having at least one ejector element secured thereto for movement in a closed path and for engaging one article carried by one pair of said lifter members located at an elevation higher than said upper conveyor for discharging the article onto the upper conveyor, a motor, and means drivingly connecting the motor to the first, second and third chains whereby the ejector and lifter members move synchronously so when each horizontally aligned pair of said lifter members are raised a distance equal to said predetermined distance the ejector causes said one article to be discharged from said one pair of the lifter members onto the upper conveyor.

3,944,047

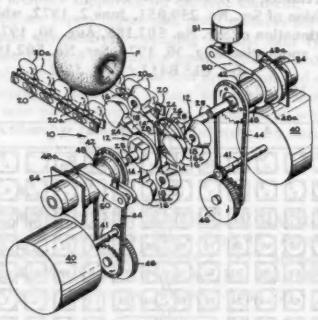
SELECTIVE REJECT MECHANISM FOR DISCHARGING FRUIT OR THE LIKE FROM A CONVEYOR

Harold J. Mumma, Riverside, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Dec. 18, 1974, Ser. No. 534,010

Int. Cl.[2] B65G 47/00

U.S. Cl. 198—25 11 Claims



1. A discharge mechanism for diverting an article off a generally horizontally arranged conveyor, said mechanism comprising a diverting arm which includes a resilient abutment member at one end thereof, rotary mounting means connected to the other end of said arm for mounting said arm for rotary movement about an axis extending generally transversely to the direction of movement of said conveyor wherein said arm is arranged to rotate in a generally vertical plane lying adjacent to one edge of said conveyor and extending generally parallel to said conveyor, means for rotating said arm through a predetermined angular distance so that the portion of the arm which moves in the plane of the conveyor is moved in the direction of movement of the conveyor and in a path so as to cause said abutment member to strike an article on the conveyor when said arm portion is moving in the direction of movement of the conveyor, means for automatically

stopping the movement of said arm after it has moved through said predetermined angular distance, and means for selectively actuating said arm rotating means so as to cause said abutment member to move through said predetermined angular distance and engage one side of said article on the conveyor and thereby cause the article to be deflected off the other edge of said conveyor.

3,944,048

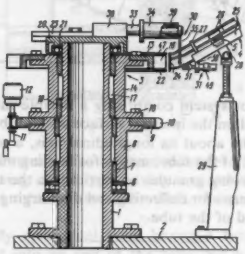
MECHANISM FOR LOADING LAMP CAPS INTO THE CELLS OF AN ENDLESS CHAIN CONVEYOR

Gennady Ivanovich Grishaev, prospekt 50 let Oktyabrya, 103, kv. 15, and Nikolai Ivanovich Tsygankin, ulitsa Anny Iuss, 2, kv. 25, both of Saransk, MASSR, U.S.S.R.

Filed Apr. 2, 1975, Ser. No. 564,355

Int. Cl.² B65G *47/00*

U.S. Cl. 198—25 **5 Claims**



1. A mechanism for loading lamp caps into the cells of an endless chain conveyor, comprising: a stationary guide arranged to accommodate lamp caps in a line, one behind the other; a rotor adapted to be driven from said chain conveyor and designed to carry lamp caps to the chain conveyor cells; radial slots provided in said rotor for the purpose of accommodating lamp caps being carried to the chain conveyor cells; a stationary plate located underneath the rotor to serve as a bottom cover of the rotor slots in the portion of the rotor travel which carries lamp caps to the chain conveyor cells; a shoulder provided on said stationary plate and arranged to extend over the side of the rotor so as to prevent lamp caps from dropping out of the rotor slots; a spring-loaded retainer provided between the rotor and the stationary guide for the purpose of retaining lamp caps in said guide, said retainer being adapted to be positively moved out of the retaining position at periodic intervals, when a rotor slot arrives at said guide; a means for positively moving lamp caps from said stationary guide into the rotor slots; cams provided on said rotor for the purpose of periodically acting upon said retainer in order to move it out of the retaining position and thereby permit lamp caps to be positively moved into the rotor slots by said means.

3,944,049

CONVEYOR SYSTEM AND METHOD FOR ASSURING A CONTINUAL BACKLOG

Wilbur H. Graybill, R.D. No. 2, Lititz, Pa. 17543

Continuation of Ser. No. 383,711, July 30, 1923. This application Jan. 6, 1975, Ser. No. 538,947

Int. Cl.² B65G *47/26*

U.S. Cl. 198—34 **13 Claims**

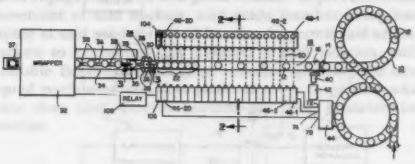
1. A method of handling articles comprising the following steps:

conveying articles at a predetermined and substantially constant rate;

collecting a backlog of abutting conveyed articles;

depleting the backlog by removing articles therefrom at a rate substantially less than said constant rate;

simultaneously and individually sensing each of said conveyed articles including articles in said backlog; and



supplying articles to be conveyed at a variable rate inversely related to the number of sensed articles in said backlog.

3,944,050

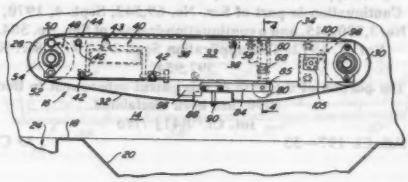
GRAVIMETRIC FEEDER

Edward Kane, Millville, N.J., assignor to K-Tron Corporation, Glassboro, N.J.

Filed Mar. 11, 1974, Ser. No. 449,789

Int. Cl.² B65G *15/00, 15/30*

U.S. Cl. 198—37 **15 Claims**



1. A feeder comprising a frame having first and second rollers, an endless belt extending around said rollers, a motor coupled to one of said rollers for driving said belt, a tracking and tensioning assembly, means mounting said assembly between upper and lower runs of said belt for movement in a vertical direction between an upper inoperative position and a lower operative position, said assembly including at least one tensioning roller disposed for rotation about an axis transverse with respect to the lower run of said belt, said tensioning roller being in contact with the juxtaposed inner surface of the lower run of the belt in the operative position of said assembly, said assembly including first and second shoes, each shoe being supported adjacent a different edge of the lower run of the belt, each shoe being rotatable about a vertical axis, said shoes being movable as a unit with said tensioning roller between said operative and inoperative positions of the assembly, said assembly being biased downwardly toward said operative position, and latch means supported by the frame for selectively retaining said assembly in its upper inoperative position.

3,944,051

AUTOMATIC PACKAGE SELECTOR

George R. Weaver, Maple Shade, N.J., assignor to Campbell Soup Company, Camden, N.J.

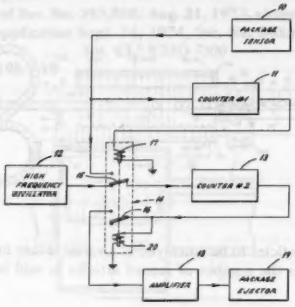
Filed Sept. 13, 1974, Ser. No. 505,779

Int. Cl.² B65G *43/00*

U.S. Cl. 198—40 **11 Claims**

1. Article selecting apparatus comprising: article sensing means to sense articles passing the sensing means and produce a signal as an article passes the sensing means, means to select

at random one article out of every preselected number of articles passing the sensing means, and means to remove said



selected article from the remaining articles passing the sensing means.

3,944,052

SINGLE ELEMENT FLEXIBLE TYPE DRUM

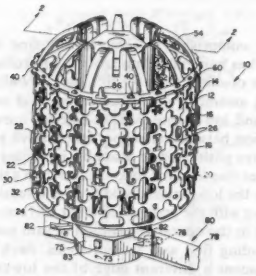
Robert E. Boyden, Temple City, Calif., assignor to Thomas B. O'Reilly, Santa Barbara, Calif.

Continuation-in-part of Ser. No. 69,542, Sept. 4, 1970, Pat. No. 3,780,845, and a continuation-in-part of Ser. No. 304,365, Nov. 7, 1972. This application Sept. 17, 1973, Ser. No. 397,954

The portion of the term of this patent subsequent to Dec. 25, 1990, has been disclaimed.

Int. Cl.[2] B41J 1/46

U.S. Cl. 197—53 33 Claims



1. A type drum comprising:

a cylindrical shell having a plurality of circumferential rows spaced apart axially, each of said rows having a plurality of circumferentially spaced apart type characters on the exterior surface thereof;

a hub within said shell and spaced therefrom, said hub having first means for mounting said drum on a drum support; and

second means connecting said shell to said hub, said second means being resilient and flexible in a direction transverse to the longitudinal axis of said shell enabling movement of the entire shell relative to said hub in a direction transverse to the longitudinal axis of said shell, and

means for applying a force in the transverse direction causing said second means and said entire shell to move in the transverse direction.

3,944,053

CONVEYOR SYSTEMS

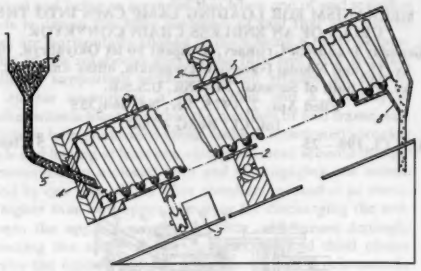
Michael Richard Hayes, Preston, England, assignor to British Nuclear Fuels Ltd., Warrington, England

Filed Nov. 4, 1974, Ser. No. 520,869

Claims priority, application United Kingdom, Dec. 6, 1973, 56702/73

Int. Cl.[2] B65G 47/16, 33/00

U.S. Cl. 198—64 7 Claims



1. A conveyor system comprising a flexible tube, a helical channel defined on the internal surface of the tube, means for rotating the tube about its longitudinal axis, a rotatable seal closing one end of the tube, means for feeding material in the form of free flowing granules or particles to the tube through the seal, and means for collecting and discharging the material at the other end of the tube.

3,944,054

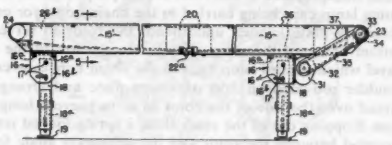
MODULAR CONVEYOR

James L. Ensinger, Mentor, Ohio, assignor to Power Pack Conveyor Company, Cleveland, Ohio

Filed Dec. 30, 1974, Ser. No. 537,080

Int. Cl.[2] B65G 11/00

U.S. Cl. 198—118 7 Claims



1. A modular conveyor comprising a metal frame having two parallel longitudinal sides, a conveyor bottom plate and rigid means near opposite ends of said frame fixing said sides in said parallel relationship, one of said means having legs removably attached thereto, the other of said means having legs attached thereto for angular adjustment, an idler roll rotatably mounted between said sides at the end having said one means, a drive roll having a shaft rotatably mounted between said sides at the end having said other means, an endless conveyor in said frame and extending around both of said rolls, power drive means mounted on said other means and operatively connected with said drive roll, whereby said frame may be supported on said legs at both ends for use with said frame generally horizontal, or said legs at said one end may be removed and said legs at said other end adjusted to permit said legless end to rest on a supporting surface for use with said frame inclined, said frame sides being each in two aligned portions with means for joining said portions at a meeting point intermediate the ends of said frame, said joining means including interfitting parts on each side telescopingly sliding snugly from each aligned portion into the other aligned portion mutually supporting said joined portions in a rigid frame structure, and means for locking said aligned portions

together, and said drive roll and said idler roll being rotatably mounted in bearing mounts identical in section with said interfitting parts and having joining means connecting them identical with said first named joining means, whereby to make possible multiple arrangements for said rolls and said two aligned frame portions using a limited number of parts.

3,944,055
END MEMBER FOR DRIVEN ROLLERS OF ROLLER CONVEYORS

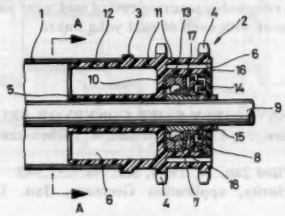
Karl Stumpf, Goethestrasse 1, 4 Dusseldorf, Germany

Filed July 12, 1974, Ser. No. 488,260

Claims priority, application Germany, July 23, 1974, 7325970[U]

Int. Cl.² B65G *13/04*

U.S. Cl. 198—127 R **5 Claims**



1. An end member for a driven roller for a roller conveyor, the roller being of the type having a center shaft and a tube mounted for rotation about the shaft, the end member comprising

a generally cylindrical body having a first portion to be inserted into an end of the tube and a second portion outside of the tube,

said first portion including an outer sleeve dimensioned to frictionally fit the interior of the tube, an inner sleeve surrounding the center shaft, said inner sleeve being spaced from said shaft and from said outer sleeve, and radial web means interconnecting said inner and outer sleeves;

shoulder means integrally formed on the exterior of said body between said inner and outer portions thereof for limiting the insertion of said body into said tube;

at least one gear ring integrally formed on said second portion of said body outside of the tube, said gear ring being axially spaced from said shoulder means;

an antifriction bearing having an outer race and an inner race, said inner race being insertable over the center shaft of said roller; and

means defining a chamber in said second portion of said body for receiving and retaining said outer race.

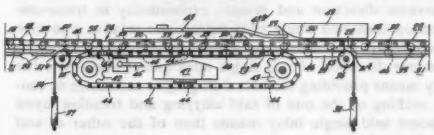
3,944,056
PIVOTED BUCKET CONVEYOR

William J. Feehery, Jr., Havertown, Pa., assignor to Campbell Soup Company, Camden, N.J.

Continuation-in-part of Ser. No. 461,602, April 17, 1974, abandoned. This application Oct. 11, 1974, Ser. No. 514,088

Int. Cl.² B65G *17/16*

U.S. Cl. 198—146 **22 Claims**



1. A pivoted bucket conveyor including conveyor means to move buckets along a predetermined path, means pivotally connecting the buckets to said conveyor to permit dumping of selected buckets at a predetermined location, dump means at said predetermined location to dump the contents of said selected buckets at said location by engaging and causing rotation of said buckets about the pivotal connection of said buckets to said conveyor, a first guide member extending generally parallel to said conveyor, guide means on said buckets in engagement with said guide member to prevent rotating movement of said buckets, said guide member being interrupted at said predetermined location to permit said selected buckets to be rotated and dumped at said location, and a yieldable flexible second guide member spanning the interrupted portion of said first guide member to guide buckets other than said selected buckets past said predetermined location.

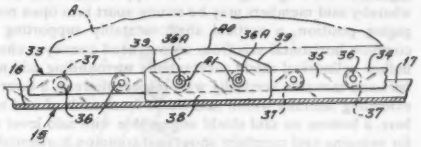
3,944,057
ARTICLE PROPELLING MECHANISM FOR CONVEYING APPARATUS

Thomas J. Schuette, Crestwood, and Harold L. Turnbough, St. Louis, both of Mo., assignors to Alvey, Inc., St. Louis, Mo.

Filed June 24, 1974, Ser. No. 482,004

Int. Cl.² B65G *19/02*

U.S. Cl. 198—160 **2 Claims**



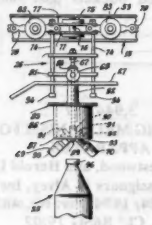
1. Article propelling mechanism for conveying apparatus comprising longitudinally extending and spaced article supporting memebers defining the conveying path, endless drag means having an operative span directed lengthwise between said articles supporting members, a plurality of article motion exciting means connected to said endless drag means in spaced relation, a slide surface extending lengthwise beneath said operative span of the drag means, each of said motion exciting means including a pair of bodies secured to the opposite sides of said endless drag means and extending below said drag means to slidingly engage said slide surface to support and maintain said drag means elevated above said slide surface and out of contact therewith and with upwardly presented friction propelling mid-surfaces presented to engage articles deposited on said article supporting members and oppositely inclined surfaces extending therefrom, said oppositely inclined surfaces rendering the conveyor drag means operative in reverse directions of movement, and power drive means operatively connected to said drag means to repeatedly move said motion exciting means on said slide surface, whereby the friction propelling surfaces engage and propel the articles along said supporting members, said friction propelling surfaces being shaped to present said oppositely inclined sloping surfaces at an elevation relative to said conveying path such that the lead surface can selectively partially slide beneath and propel a single article and can slide beneath the rearmost one of a group of articles in tandem accumulation in said conveying path so as to lift the rearmost article for obtaining an increase in the frictional propelling effort to effectively propel a group of articles.

3,944,058

BOTTLE CONVEYOR SYSTEM INCLUDING ADJUSTABLE HEIGHT CONTINUOUS BELT CONVEYOR AND POSITIVE LOCK SPRAY SHIELDED ROTATABLE BOTTLE CARRIER

Leopold Strauss, East Rockaway, N.Y., assignor to Indian Head Inc., New York, N.Y.

Division of Ser. No. 352,682, April 19, 1973, Pat. No. 3,860,104. This application May 6, 1974, Ser. No. 467,398
Int. Cl.² B65G 19/00
U.S. Cl. 198—179 6 Claims



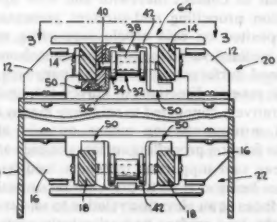
4. An overhead bottle carrier comprising in combination a pair of semi-cylindrical clam shell members adapted to surround and lockably engage the neck of a bottle, a common horizontal pivotal axis supporting both said members along adjacent abutting edges at the upper diameter thereof whereby said members may be swung apart into open nonengaging position, a vertical shaft rotatably supporting said common horizontal axis from an overhead conveyor chain, a hollow cylindrical shield substantially surrounding said members and movable vertically with respect thereto, a lever arm extending laterally within said shield from each of said members, a bottom on said shield engageable with said lever arms for swinging said members about said common horizontal axis into open position when said shield is raised vertically, a coaxial central bore in the bottom of said shield engageable with said members to close the same into locked neck-gripping position when said shield is lowered around said members and a cam follower linkably connected to said shield and engageable with a cam for vertically raising and lowering said shield.

3,944,059

ENDLESS CHAIN CONVEYOR LINK

Francis J. Garvey, Newfield, N.J., assignor to Garvey Corporation, Hammonton, N.J.

Filed Sept. 20, 1974, Ser. No. 507,742
Int. Cl.² B65G 17/00
U.S. Cl. 198—189 7 Claims



1. A plate top conveyor chain apparatus having an upper operative run and a lower return run comprising

an endless chain having a plurality of yoke links forming operative components thereof,

each of said yoke links being of inverted channel shape, having a web portion adapted to support a plate top mounted thereon,

side flanges right-angularly extending from the side edges of said web portion,

and a pair of feet right-angularly oppositely outwardly extending from the distal ends of the side flanges,

unitary one-piece wear pads formed of anti-friction material each having two right-angularly related portions comprising a first portion engaged with the outer surface of a yoke link side flange for contact with the vertical surface of a guide rail to constrain lateral movement of the chain in the operative run of the apparatus and a second portion engaged with the upper surface of the yoke link foot for contact with the horizontal surface of a rail providing vertical support for the chain in the return run of the apparatus,

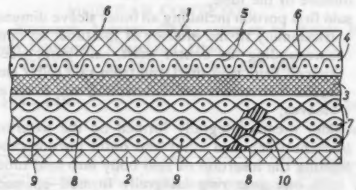
and means removably securing two of said wear pads in said engagement with each of said yoke links.

3,944,060

TRANSVERSELY STIFF CONVEYOR BELT

Karl Hartmann, 37, Liebrechtstrasse, 413 Rheinkamp-Utfort, Germany

Filed Jan. 11, 1974, Ser. No. 432,542
Claims priority, application Germany, Jan. 12, 1973, 7301108[U]
Int. Cl.² B65G 15/34
U.S. Cl. 198—193 10 Claims

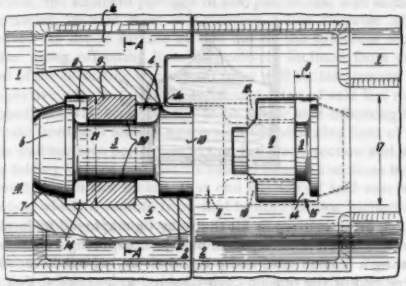


1. A transversely stiff conveyor belt of elastomeric material provided at both sides of a nuclear layer of elastomeric material between said nuclear layer and a carrying layer and treading layer, respectively, with inlay means of a filament network each having transversely disposed weft threads, wherein a single inlay means comprising high-strength, low-expansibility, weft threads and being itself expansible in longitudinal direction is provided at one side of said nuclear layer, and wherein at least one inlay means at the other side of said nuclear layer affords tensile strength in longitudinal direction and the inlay means at said other side of said nuclear layer provides greater resistance against compressive forces in transverse direction and greater expansibility in transverse direction than said single inlay means, the relative tranverse expansibility and resistance against compressive forces in tranverse direction of said single inlay means and said other inlay means providing the belt with greater resistance to convex arching of the one of said carrying and treading layers adjacent said single inlay means than of the other of said carrying and treading layers and greater resistance to concave troughing of the other of said carrying and treading layers than of the one of said carrying and treading layers adjacent said single inlay means.

3,944,061
TROUGH CONVEYOR CONSTRUCTION, PARTICULARLY FOR SCRAPER CHAIN CONVEYORS

Ernst Braun, and Gert Braun, both of Essen-Heisingen, Germany, assignors to Halbach and Braun, Germany

Filed Oct. 24, 1974, Ser. No. 517,778
Claims priority, application Germany, Nov. 6, 1973, 2355325
Int. Cl.² B65G 15/60
U.S. Cl. 198—204 11 Claims

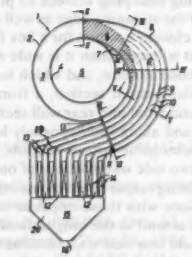


1. A conveyor trough construction, particularly for scraper chain conveyors, comprising a conveyor having longitudinal sidewalls formed of a plurality of abutting sections each having a longitudinally extending bore therethrough defined by interior walls having conical portions at each end tapering toward the adjacent end, a bolt extending through the bores of adjacent section pairs and having a conical portion at each end tapering toward the adjacent end and complementary to the conical wall portions defining the bores, each section having a side wall opening which extends into said bore, and a locking spring inserted in the side wall portion and engaged over said coupling bolt, the interior walls of said bore being dimensioned in the vicinity of said locking spring to provide an axial clearance for said locking spring.

3,944,062
APPARATUS FOR SORTING AND CONVEYING OF OBJECTS

Alexander Keller, Pestalozzistr. 7, 404 Neuss (Rhine), Germany

Filed Oct. 30, 1974, Ser. No. 519,103
Claims priority, application Germany, Oct. 30, 1973, 2354245; Mar. 22, 1974, 2413906
Int. Cl.² B65G 27/00
U.S. Cl. 198—220 BA 14 Claims

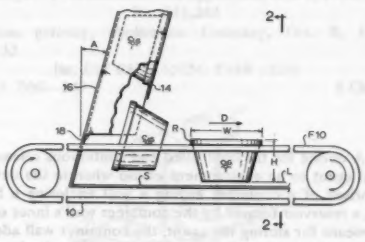


1. Apparatus for sorting and conveying of similar objects having opposite sides, one of which is flat and which are connected by a side wall having a bevel adjacent the other side, comprising means for supplying a stream of said objects in random orientation and in overlapping relationship; guide ramp means having one end for receiving said stream and conically diverging in width towards another end, said guide ramp means being progressively downwardly inclined from the horizontal in direction towards said other end; guide rail means on said guide ramp means and forming thereon a plurality of longitudinally extending parallel guide channels each having a height slightly greater than the distance between said sides of said objects; sorting channel means in the region of said other end and comprising a plurality of pairs of sorting channels communicating with the respective guide channels, each pair of sorting channels including a first sorting channel for receiving from the associated guide channel such objects as have a desired orientation and a second sorting channel for receiving such objects as have an undesired orientation; routing means upstream of said pairs of sorting channels and operative for routing the objects into said first or second sorting channel of the respective pair in dependence upon the orientation of the respective object; and reversing means associated with said second sorting channel of each pair for reversing the position of the objects therein so that they assume said desired orientation.

3,944,063
CONTAINER ORIENTING DEVICE

George H. Lederer, 75 Gordon Road, Willowdale, Ontario, Canada

Filed Oct. 25, 1974, Ser. No. 518,099
Int. Cl.² B65G 47/24
U.S. Cl. 198—255 4 Claims



1. Method of orienting open ended containers which are a surface of revolution about the intended vertical axis thereof, said containers being shaped so that their largest diameter is located at the open end, and so shaped that their maximum vertical dimension is less than said largest diameter, comprising the steps of:

providing a pair of belts each of which is arranged to provide a flight to partly support such a container below said largest diameter,

said flights being arranged to be parallel, directed in the same travel direction and spaced to support diametrically opposed portions of said largest diameter,

causing said belts to operate so that each of said flights move in the travel direction,

delivering such containers downwardly toward said belt flights, in one of two orientations, i.e. with the bottom of the container leading or trailing in the direction of belt travel so that the downwardly leading surface of the largest diameter of a container will pass between said belt flights and then contact both said flights,

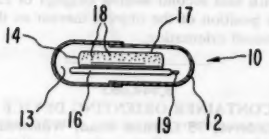
the angle of delivery of such containers being selected with a range so that the plane of the portion of largest diameter intersects said flights along a line approximately perpendicular to the travel direction and the slope of such planes is from the vertical to directions downward and rearward relative to the travel direction.

3,944,064

SELF-MONITORED DEVICE FOR RELEASING AGENT AT FUNCTIONAL RATE

John D. Bashaw, Palo Alto; Alejandro Zaffaroni, and Alan S. Michaels, both of Atherton, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Oct. 26, 1973, Ser. No. 410,244
Int. Cl.² A23F 1/08; B65D 85/70
U.S. Cl. 206—.5 10 Claims



1. A device for the controlled and continuous release of a useful agent to an environment of use wherein the device is comprised of a container having a wall enclosing a hollow area, a reservoir formed by the container wall's inner surface as a means for storing the agent, the container wall additionally formed in at least a part of a self-monitored release rate controlling essentially imperforate homogenous material permeable to the passage of the agent by diffusion for releasing agent from the reservoir, a support member for carrying the container with the wall of the container covering at least a portion of the surface of the support and suitably fixed thereto, said support member movable from a collapsed position to an expanded position and movable from an expanded position to a collapsed position after a period of agent release time, and wherein agent is metered from the reservoir through the wall in a useful amount for a prolonged period of time when the device is in the selected environment of use.

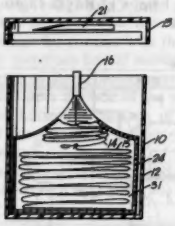
3. A useful device for the release of a useful agent, wherein the device is comprised of a container having a wall enclosing a hollow area, a reservoir formed by the container wall's inner surface as a means for storing the agent, said container wall defining the reservoir formed in at least a part of a microporous material whose micropores contain an agent release rate controlling medium permeable to the passage of the agent at a predetermined rate by diffusion, a support member for carrying the container with a wall of the container covering at least a portion of the support and suitably united thereto, with the support member movable from a collapsed position to an expanded position and returnable to a collapsed position after a period of agent release time, and wherein agent is metered from the reservoir by passage through a medium housed in the micropores of the wall of the container in an effective amount for a prolonged period of time when the device is placed in the environment of use.

3,944,065

DRIVE BELT REPAIR KIT

Douglas W. Wooddy, Jr., and Muna G. Wooddy, both of 7005 Martin Drive, Apt. 208, Lake Kenilworth Apts., New Orleans, La. 70126

Filed Sept. 17, 1974, Ser. No. 506,785
Int. Cl.² B65D 69/00, 71/00
U.S. Cl. 206—223 2 Claims



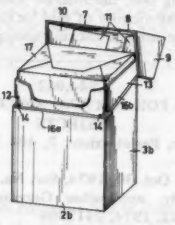
1. A drive belt repair kit that may be employed to form a continuous belt about a pair of pulleys, comprising a container housing a tension cord and a liquid air-drying adhesive, with a free end of the tension cord fastened to a sealed orifice of the container, prior to use.

3,944,066

CUT FOR A BOX FOR CIGARETTES AND CIGARILLOS AND BOX MADE THEREFROM

Otto Niepmann, Gevelsberg, Germany, assignor to Maschinenfabrik Fr. Niepmann & Co., Gevelsberg, Germany

Filed Dec. 16, 1974, Ser. No. 533,241
Claims priority, application Germany, Dec. 15, 1973, 2362427
Int. Cl.² B65D 5/66
U.S. Cl. 206—268 5 Claims



1. A cut of paper material having applied thereto only nominal force during stamping thereof to provide a satisfactory appearance of the stamping edge as well as a good seating of the cover in the closure position for a box for cigarettes and cigarillos which cut is longer than it is wide and has an inside surface and an outside surface, and which includes in combination: a rectangular bottom section, a front wall section, a rear wall section, said front and rear wall sections respectively being arranged at and along the oppositely located longitudinal sides of said rectangular bottom section, two pairs of side wall sections, the two side wall sections of one of said pairs of side wall sections being respectively connected to and forming a single integral piece with those opposite sides of said front wall section which extend in the longitudinal direction of said cut, each pair of said one side wall sections being foldable in the direction toward the inside surface of said front wall section so as to form a right angle therewith, and the two side wall sections of the other one of said pairs of side wall sections being respectively connected to and forming a single integral piece with those opposite sides of said rear wall section which

extend in the longitudinal direction of said cut, each side wall section of said other pair of side wall sections foldable in the direction toward the inside surface of said rear wall section so as to form a right angle therewith, the side wall sections of one of said pairs of side wall sections having extension flaps arranged adjacent said bottom section and foldable thereonto, said front wall section being provided at its free edge with a cut-out and having a portion near said cut out offset along an offsetting line toward the inside surface of said front wall section by a distance approximating the thickness of said cut, said offsetting line extending over the width of said front wall section, the adjacent portions of said pair of side wall sections pertaining to said front wall section being likewise offset toward the inside surface of said cut by the thickness of the latter along offsetting lines respectively inclined from each end of the offsetting line of said front wall section toward the respective adjacent oppositely located edge of said last mentioned side wall sections, the areas where said offsetting line of said front wall section meets with the offsetting lines of the side wall sections pertaining to said front wall section and with the folding lines of said last mentioned side wall sections being provided with slot means, that end portion of said rear wall section which is remote from said bottom section including a strip extending throughout the width of said rear wall section and being foldable toward the outside surface of said rear wall section, the side wall sections pertaining to said rear wall section being each provided with a slot extending from the ends of said folding line to said strip at an angle slightly into said rear wall section and also through the respective one of each of said last mentioned side walls along the width thereof and in a direction at an acute angle relative to the folding lines of the respective side wall sections pertaining to said rear wall section, and a lid connected to and forming one single piece with said strip, said lid including a top section alongside said strip and also a front part alongside said top section and side portions foldable in the direction toward the inner surface of said front part and having an inclined free edge with an angle of inclination corresponding to that of said offsetting lines of the side wall sections pertaining to said front wall section, one end of said side wall sections pertaining to said rear wall section having an extension foldable along a line forming an extension of the folding line along which said strip is united to said rear wall section, said one end of each of said last mentioned side wall sections being foldable onto said top part of said lid, each of said slot means extending at least along a portion of the respective offsetting line of that end portion of said front wall section which is provided with said cut-out and along a portion of the folding lines of the side wall sections adjacent thereto in the direction toward the adjacent end of said cut.

3,944,067

AUTOMATIC FASTENER FEED MAGAZINE AND FEED BELT

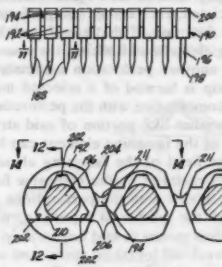
Andrew G. Bakoledis, Clinton, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 408,341, Oct. 23, 1973, Pat. No. 3,863,824. This application Nov. 21, 1974, Ser. No. 525,688

Int. Cl.² B65D *85/24*

U.S. Cl. 206—347 **3 Claims**

1. A belt for holding a plurality of fasteners of the type including a head portion, a shank portion, and a tapered tip portion, said belt including a plurality of fastener receiving sleeves interconnected by webs, each sleeve having an internal generally triangularly shaped cross sectional configuration,



the fastener being engaged along a portion of its shank portion by each of the sides of said triangle.

3,944,068

FASTENING ELEMENT HOLDER STRIP WITH BREAK-OFF LOCATIONS

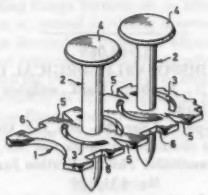
Elmar Maier, Feldkirch-Tisis, Austria, and Robert Tilg, Schaan, Liechtenstein, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Continuation-in-part of Ser. No. 355,660, April 30, 1975, Pat. No. 3,904,032, which is a continuation of Ser. No. 174,846, Aug. 25, 1971, abandoned. This application Oct. 2, 1974, Ser. No. 511,261

Claims priority, application Germany, Oct. 8, 1973, 2350433

Int. Cl.² B65D *85/24;* **F16B** *15/08*

U.S. Cl. 206—347 **2 Claims**



1. A holder assembly for supplying fastening elements into the barrel of a setting device so that the fastening elements can be driven into a target material by means of a piston driven by an explosive force developed within the setting device, the holder assembly includes a flat elongated strip having a plurality of holes therethrough spaced apart in the elongated direction of the strip and a fastening element positioned within each hole, each fastening element includes an elongated shank having a first end and a second end with the first end arranged to be inserted first into the target material and a head extending transversely laterally outwardly from the circumferential periphery of the shank at the second end thereof, the shank of each said fastening element being secured within one of the holes in said holder strip, said holder strip having a width greater than the diameter of the heads of the fastening elements so that the sides of the strip extend laterally outwardly beyond the lateral periphery of the heads, said holder strip being perforated inwardly of the sides of said strip adjacent to and on opposite sides of each hole so that at least a pair of perforations are spaced radially outward relative to the hole with which the perforations are associated, said perforations are separate and spaced from the perforations associated with the adjacent holes, said perforations being aligned with the lateral periphery of the head of said fastening element in the

hole with which said perforations are associated and extending in the direction of the lateral periphery of the head, each said perforation having a pair of ends spaced apart in the direction of the lateral periphery of the head of said fastening element with which it is associated, each end of said perforations being spaced apart in the direction of the lateral periphery of the head of the fastening element with which it is associated from an adjacent end of another perforation associated with the hole, said holder strip is formed of a selected material and thickness so that in combination with the perforations formed about each hole a washer-like portion of said strip laterally enclosing the shank of the fastening element can be punched from the strip by the head of the fastening element as it is driven into the target material by the explosive force driven piston in the setting device with the perforations assisting in the punching out of the washer-like portion, wherein the improvement comprises means in said holder strip shaped for providing a pair of break-off locations associated with at least certain of the holes in said holder strip so that as a fastening element positioned within the hole with which the break-off locations are associated, is inserted through the strip into the target material it traverses the break-off locations and provides a separation between a portion of the strip containing the just inserted fastening element from the remaining strip containing the fastening elements to be fed to the setting device, said break-off locations each extending inwardly from an opposite longitudinal edge of the strip to a point at least aligned with the lateral periphery of the head of the fastening element which passes through the strip and located between the adjacent ends of two of said perforations, said means for providing break-off locations comprises a V-shaped notch forming each break-off location with said notch cut through said strip and extending inwardly from the longitudinal edge of the strip transverse to the longitudinal direction of the strip at least to a point in alignment with the lateral periphery of the head of the fastening elements held in the hole with which the break-off location is associated, and the wider portion of the V-shaped notch being located along the longitudinal edge of said strip.

3,944,069

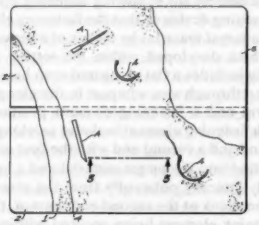
RECEIVER FOR DISPOSABLE SURGICAL IMPLEMENTS

John D. Eldridge, Jr., Anaheim, Calif., assignor to Instranetics, Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 868,317, Oct. 22, 1969, abandoned, and a continuation-in-part of Ser. No. 182,588, Sept. 22, 1971, abandoned. This application Jan. 8, 1974, Ser. No. 431,629

Int. Cl. A61l *17/02;* **B65d** *73/00, 85/24*

U.S. Cl. 206—350 **4 Claims**



1. A receiver for pointed disposable surgical implements for holding such implements selectively accessible and for selectively encasing and holding said implements for disposal, comprising:

a. a first and a second pad element formed of yieldable, penetrable foamed plastic material;

b. a penetration resistant backing element for each pad element;

c. hinge means foldably connecting the pad and backing elements to permit movement of the pad elements between an essentially coplanar position, and a mutually face-to-face contacting position;

d. a pressure sensitive adhesive coating on the outer face of one of the pad elements, the outer face of the other pad element being adhesive free;

e. a removable protective lamination initially covering the adhesive coating, whereby said receiver may be arranged in said coplanar relation and implements placed on said adhesive free pad for selective removal and replacement and whereby said adhesive coated pad, with said protective lamination removed, may be folded over said other pad and implements thereon to adhere to said other pad and encase said implements between said pads and penetration resistant backing elements.

3,944,070

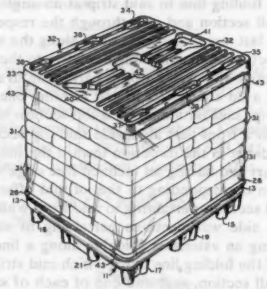
PALLET AND AN INTEGRAL PACKAGE UTILIZING THE PALLET

Charles G. Cardwell, Bartlesville, Okla., and Morris E. Speck, Akron, Ohio, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 9, 1974, Ser. No. 504,069

Int. Cl.² B65D *19/00*

U.S. Cl. 206—386 **10 Claims**



1. A fork lift pallet having a generally rectangular bottom wall, a continuous sidewall extending upwardly from the outer periphery of said bottom wall, said bottom wall having a load supporting portion and a plurality of leg portions, each leg portion having a hollow support leg formed therein and extending downwardly below said load supporting portion, said support legs being arranged in at least two spaced rows at least generally parallel to two opposed sides of said bottom wall to permit the entry of the tines of a fork lift between adjacent legs from any side of the pallet, a retention ledge extending outwardly from the upper end of said sidewall to provide a horizontal lip at the upper extremity of the pallet.

3,944,071

FILAMENTARY TOW PACKAGE AND METHOD FOR MAKING

George Arvid Fernstrom, Seaford, and James Richard Osborn, Jr., Wilmington, both of Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

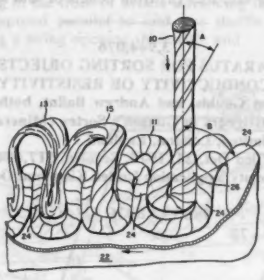
Filed Sept. I2, 1974, Ser. No. 505,493

Int. Cl.² B65D *85/00;* **B65H** *54/84;* **D01H** *7/92*

U.S. Cl. 206—388 **3 Claims**

1. A tow package comprising a plurality of contiguous layers of multifilament tow, each layer having a plurality of substantially vertical folds impacted with folds of adjacent layers, said tow having adjacent sections of opposite twist each of said adjacent sections encompassing a length of less than 20

feet as measured along unfolded tow, said adjacent sections of opposite twist being separated by sections of substantially zero

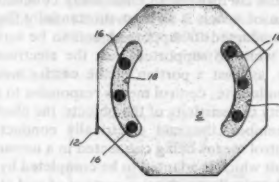


twist, said sections of substantially zero twist being less than 5 feet long.

3,944,072
OCTAGONAL DISPENSER CARTON FOR BAND SAW COILS

Richard V. Budington, Somers, Conn., and Michael F. Bradley, West Springfield, Mass., assignors to Longview Fibre Company, Longview, Wash.

Filed June 2, 1975, Ser. No. 582,754
Int. Cl.² B65D *85/672*; B65H *5/28*
U.S. Cl. 206—395 **8 Claims**



1. A flat carton blank foldable into an octagonal dispenser casing for packaging a bulk length coil of band saw stock and the like, said blank comprising

a center section having fold lines defining the edges of an end wall panel in the shape of a regular octagon, rectangular side wall panel sections extending from said edges, and polygonal end wall flaps having fold line connections at the outer edges of side wall sections,

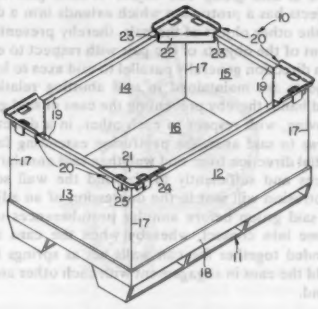
alternate flaps around the blank each having an outer edge parallel to the side wall fold line connection thereof and in overall outline being substantially a mirror image of the adjacent half of said octagonal center panel,

each of the remaining flaps having side edges provided with inner portions divergently directed and angled at approximately 135° from the side wall fold line connections thereof, generally parallel intermediate edge portions angled at about 135° from said inner portions and extending along the edges of adjacent alternate flaps, and converging outer edge portions angled at approximately 90° to each other from said intermediate portions, each said remaining flap being foldable into underlying relation to said alternate flaps adjacent thereto to form the inner ply of a multi-ply folded end wall opposite said center panel with said diverging inner edge portions being held against radial outward movement in the fold line connections of said adjacent flaps and side walls.

3,944,073
COMBINED REINFORCING AND SUPPORT MEANS FOR THE CORNERS OF A COLLAPSIBLE CONTAINER

Benjamin A. Downing, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 27, 1974, Ser. No. 527,721
Int. Cl.² B65D *21/02*
U.S. Cl. 206—503 **14 Claims**

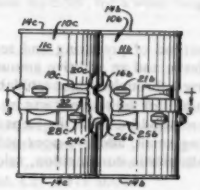


1. In a container of the type comprising a horizontally disposed base and upstanding, contiguous side walls positioned on said base to define an open top compartment therewith and a corner at the intersection of each pair of adjacent side walls, the improvement comprising a rigid combined reinforcing and support means attached to an upper end of each of said corners, said means comprising a horizontally disposed platform portion bridged between a respective pair of said side walls to collectively provide a substantial support with the other of said platform portions for additional containers stacked thereon, a locating flange formed on an inboard edge of said platform portion to extend vertically downwardly therefrom, a stacking flange formed on outboard edges of said platform portion to extend vertically upwardly therefrom and clamping flanges formed on the outboard edges of said platform portion to extend downwardly in at least general vertical alignment with said stacking flange and straddling respective side walls of said container along with said locating flange.

3,944,074
CAN PACKAGING

Phillip J. Riley, 11190 Morrine Drive, Palos Hills, Ill. 60465

Filed Aug. 29, 1974, Ser. No. 501,679
Int. Cl.² B65D *71/00*, *21/02*
U.S. Cl. 206—427 **9 Claims**



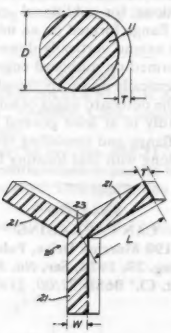
1. A can having an annular protuberance at each end and having a longitudinal axis and external walls of generally cylindrical configuration, which can is to be assembled with other like cans to form a group of abutting cans in which the cans have their axes parallel and held in assembled arrangement by a band about the group, which group is to be transferred from one location to another, said can being characterized by having:

a plurality of regularly arranged protrusions and depressions in said wall, each protrusion extending outwardly from said generally cylindrical wall and each depression extending inwardly from said generally cylindrical wall in the form of a socket for receiving a protrusion, said protrusions and depressions having proximal ends at said generally cylindrical wall, said protrusions and depressions being so positioned that when the cans are assembled in said group one object of each pair of abutting objects has a protrusion which extends into a depression of the other object of the pair, thereby preventing movement of the objects of the pair with respect to each other in a direction generally parallel to said axes so long as said objects are maintained in said abutting relationship by said band, thereby preventing the cans of said group from moving, with respect to each other, in a direction transverse to said axes, the protrusion extending farther in a radial direction from said wall than said annular protuberances and sufficiently far beyond the wall so that the protrusion will seat in the depression of an adjacent can of said group before annular protuberances of the two come into contact, whereby when the cans are tightly banded together the can walls act as springs tending to hold the cans in engagement with each other and with the band.

3,944,075
METHOD OF PREPARING AND SEPARATING MIXTURES OF MOLDABLE PLASTIC AND ADDITIVE AGENTS

Jack W. Kuehn, Wayzata, Minn., assignor to Tote Bulk Handling, Inc., St. Paul, Minn.

Filed Apr. 23, 1973, Ser. No. 353,468
Int. Cl.[2] B07B 1/15
U.S. Cl. 209—71 **6 Claims**



1. The method of preparing and separating a mixture of moldable plastic and an additive amount of additive material to be dispersed throughout the moldable plastic, which mixture is intended for subsequent use in a plastic molding process, which method includes the steps of:

a. obtaining small, additive-poor pellets comprising a first moldable plastic composition, said pellets having a first shape;

b. obtaining small, additive concentrate pellets comprising a second moldable plastic composition, said moldable plastic composition being rich in an additive material, at least as compared to said first moldable plastic composition, said pellets having a second shape which is classifiably different from said first shape; said additive material being a coloring agent;

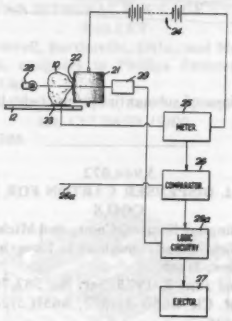
c. mixing plastic pellets of said first shape with a minor amount of pellets of said second shape, the amount of pellets of said second shape being sufficient to impart a desired color to the mixture of pellets, when the pellets have been fused and molded; and

d. classifying the mixture of said step (c) to thereby separate pellets of said step (a) from pellets of said step (b).

3,944,076
APPARATUS FOR SORTING OBJECTS BY CONDUCTIVITY OR RESISTIVITY

Anthony John Goulds, and Andrew Balint, both of London, England, assignors to Gunson's Sortex (Mineral and Automation) Limited, London, England

Filed Oct. 24, 1974, Ser. No. 517,654
Claims priority, application United Kingdom, Oct. 26, 1973, 49967/73
Int. Cl.[2] B07C 5/344
U.S. Cl. 209—73 **10 Claims**



8. Sorting apparatus comprising an electrically conductive member the location of which is at least substantially fixed; rotary carrier means adapted to support objects to be sorted and to carry them, while so supported, past the electrically conductive member, at least a portion of the carrier means being electrically conductive; control means responsive to the electrical conductivity or resistivity of the objects; the electrically conductive member, the said electrically conductive portion, and the control means being connected in a normally open electrical circuit which is adapted to be completed by an object on the said electrically conductive portion of said plate as it passes the electrically conductive member; a sorting device, controlled by said control means, for effecting a relative separation between those objects which have, and those which fail to have, a predetermined electrical conductivity, and indicator means for indicating the presence and absence of an object at the electrically conductive member.

3,944,077
SHUFFLE FEED SIZING MECHANISM

Chester Green, San Jose, Calif., assignor to Genevieve I. Hanscom and Genevieve I. Hanscom, Robert Magnuson, Lois J. Thomson, trustees of the estate of Roy M. Magnuson, all of San Jose, Calif., part interest to each

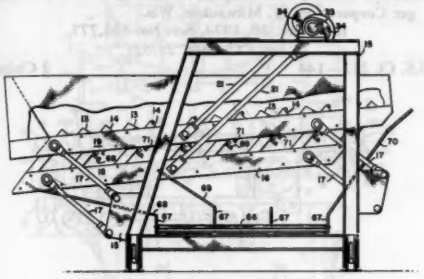
Continuation-in-part of Ser. No. 168,094, Aug. 2, 1971, abandoned, which is a continuation-in-part of Ser. Nos. 706,505, Feb. 19, 1968, Pat. No. 3,543,928, and Ser. No. 33,814, May 1, 1970, abandoned. This application Aug. 23, 1972, Ser. No. 283,209
Int. Cl. B07b 1/15
U.S. Cl. 209—73 **7 Claims**

1. In a shuffle feed sizing mechanism having a first set of transversely disposed shuffle members, a second set of similarly disposed shuffle members arranged in alternating parallel relation with said first set to provide transverse valleys;

means for effecting reciprocation of at least one set of said members to advance an article from valley to valley of the feed mechanism, each of said shuffle members having a

front face and an upper face forming a corner with said front face and providing an article supporting surface, one of said shuffle members of said first set having a sizing opening in the front or article advancing face thereof;

means disposed parallel to said one shuffle member for defining a sizing opening therewith; and



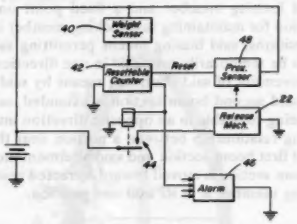
means movable with one of said sets of shuffle members and for entering said sizing opening during relative movement of the parts in the extreme relative reciprocated position of the members to reject any article too large to pass through the sizing opening.

3,944,078

COUNTER CONTROLLED PRODUCT CONVEYOR DISTRIBUTION SYSTEM

William F. Altenpohl, Gladwyne, Pa., assignor to W. F. Altenpohl, Inc. (Entire), West Conshohocken, Pa.

Filed Aug. 27, 1974, Ser. No. 500,871
Int. Cl.² B07B *13/08*
U.S. Cl. 209—73 **10 Claims**



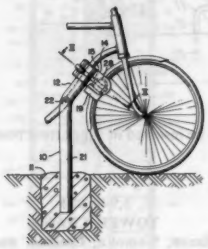
1. In combination with a system for conveying objects from a loading station to a plurality of operating stations at which only the objects within a common weight range are released from a conveyor by release devices under control of weight sensors, means for regulating distribution of said objects within the common weight range at said operating stations, comprising counter means connected to each of said weight sensors for counting different preset numbers of said objects detected by said weight sensors, the number of objects counted by each of the counter means being inversely related to the distance of the associated operating stations from the loading station, control means connected to the counter means and the release devices for releasing an equal number of said objects within said common weight range at each of said operating stations independently of the supply of objects thereat and means for resetting each of the counter means in response to operating of an associated one of the releasing devices.

3,944,079

CLAMPABLE BICYCLE STAND

James Boslough, Denver, Colo., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 3, 1975, Ser. No. 546,496
Int. Cl.² E05B *73/00*, *67/38*
U.S. Cl. 211—5 **1 Claim**



1. A bicycle stand for retaining a bicycle in a locked position with the shackles of the lock protected from removal in the locked position, comprising

a base member adaptable for mounting along a vertical axis,

an arm member fastened to the base member, with

a pair of plates, spaced apart from each other, fitted to the arm member, said spacing being of a size to fit about a lock, with

a U-shaped bracket pivotably fixed to the arm member so that the bracket may go about a section of a bicycle frame or wheel, with a free end section of the bracket passing through a slot in one of the said plates so that said free end section of the bracket lies between the two said plates in the latched position of the bracket, said free end of the bracket formed with one or more holes of a size to fit a shackle of a lock,

in which the two plates are of a size to completely enclose both sides of the lock shackle of a lock which is fastened through a hole of the bracket in the latched position of the bracket and in which

the arm member is pivotably fastened to the base member to rotate in a plane parallel to the axis of the base member by hinge means, so that the arm member may be rotated into a position to enable the bracket to fit about a section of a bicycle frame or wheel of a bicycle which is standing adjacent to the base member, for a wide range of bicycle sizes.

3,944,080

HANGING FILE FOLDER SUPPORT STRUCTURE

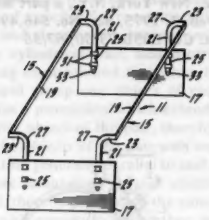
Harland W. Hansen, Muskegon, Mich., assignor to The Shaw-Walker Company, Muskegon, Mich.

Filed Mar. 17, 1975, Ser. No. 558,924
Int. Cl.² A47F *63/00*
U.S. Cl. 211—46 **3 Claims**

1. A support structure for hanging file folders, said structure including a pair of separate wire members adapted to be installed in a file drawer in lateral spaced relation to each other,

each wire member including an elongated generally straight center portion which receives and supports the file folders and a leg located at each end of said center portion, each of said legs having the shape of an inverted L and including a horizontally extending portion connected to

said center portion of said wire member and projecting at right angles thereto and a vertical portion which is



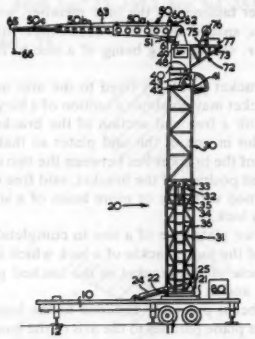
adapted to be inserted in supporting bosses and embossed loops.

3,944,081

TOWER CRANE

Donald E. Wellman, Komoka, Canada, assignor to General Crane Industries Limited, London, Canada

Division of Ser. No. 144,199, May 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 818,751, April 23, 1969, abandoned. This application Aug. 21, 1974, Ser. No. 499,419
Claims priority, application Canada, Apr. 9, 1969, 49201
Int. Cl.² B66C *23/62*
U.S. Cl. 212—46 B **13 Claims**



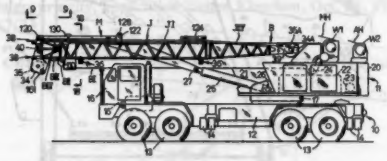
1. A tower crane comprising platform means carrying in combination a base mounting for a tower, a tower pivotally connected to said mounting for tilting movement between a vertical operating position and a substantially horizontal stored position, actuating means interconnecting the platform means and the tower for moving the tower between said positions, a jib structure carried by said tower, said jib structure comprising a turntable mounted on the top of said tower, said turntable including a rotatable part and a non-rotatable part, a jib support structure connected to the rotatable part of said turntable, power means for rotating said rotatable part of said turntable to cause slewing of the jib support structure about the longitudinal axis of the tower, a jib, a pivot mounting said jib on said jib support structure to allow luffing movement of said jib, power means connected between the jib support structure and the jib for causing said luffing movement, a hinge connection between said non-rotatable part of said turntable and the top of said tower, and power means connected between the non-rotatable part of said turntable and the top of said tower for folding the jib support structure and said turntable about said hinge connection, whereby the jib support structure and associated jib can be folded to an inoperative position along the side of the tower for storage and unfolded to an operative position to the top of said tower.

3,944,082

LOCKING MEANS FOR RELATIVELY MOVABLE BOOM SECTIONS OF BOOM OF MOBILE CRANE

Robert A. Fritsch, Cedar Rapids, Iowa, assignor to Harnischfeger Corporation, W. Milwaukee, Wis.

Filed Dec. 20, 1974, Ser. No. 534,777
Int. Cl.² B66C *23/62*
U.S. Cl. 212—144 **2 Claims**



1. In a telescopic boom for a crane: a first hollow boom section having a forward end and a second boom section having a forward end and a rear end and telescopically movable within said first boom section between a retracted position and a fully extended position; means for selectively moving said second boom section between said retracted and extended positions; and releasable locking means for maintaining said second boom section in fully extended position, said releasable locking means comprising: abutment means mounted on the exterior of and near the rear end of said second boom section and telescopable within said first boom section; and a locking assembly mounted on the exterior of and near the forward end of said first boom section and comprising: a support rigidly secured to said first boom section; a locking member rotatably mounted on said support, said locking member being selectively rotatable between one position in the path of movement of said abutment means and another position out of said path of movement of said abutment means, and overcenter biasing means connected between said locking member and a fixed point on said first boom section for maintaining said locking member in either of its said positions, said biasing means permitting said locking member to be temporarily rotatable in one direction from the path of movement of said abutment means by said abutment means as said second boom section is extended, said locking member being rotatable in an opposite direction into interfering abutting relationship between a portion near the forward end of said first boom section and said abutment means if said second boom section is moved toward retracted position while said locking member is in its said one position.

3,944,083

BOTTOM HANDLING APPARATUS FOR STEEL CONVERTER VESSELS

Howard M. Fisher; Bernd G. Albers, and John W. Mrozek, all of New Castle, Pa., assignors to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Mar. 21, 1974, Ser. No. 453,188
Int. Cl.² C21C *5/50*
U.S. Cl. 214—1 D **23 Claims**

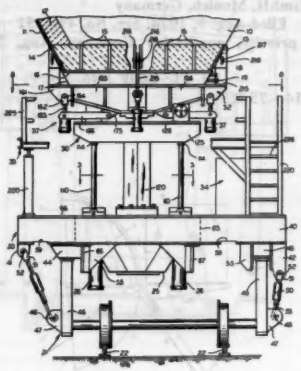
1. Apparatus for handling a vessel bottom which is attachable to and detachable from a metallurgical vessel, said apparatus comprising:

support means, lift means mounted on said support means and including power means,

bottom receiving means for receiving and supporting said vessel bottom and being mounted on said lift means for rotational and tilting movement relative thereto,

said lift means engaging said bottom receiving means and being operative to elevate said bottom receiving means vertically,

first force producing means mounted on said lift means and engageable with said bottom receiving means for selectively tilting the latter relative to a horizontal plane, and



second force producing means mounted on said lift means and engaging said bottom receiving means for selectively rotating the latter relative to said lift means and about a nominally vertical vertical axis.

3,944,084

MEANS FOR PREVENTING DRY BURN IN A PAPER-PLASTIC DUNNAGE BAG

Robert L. Reeves, Pinecrest Circle Drive, Sheridan, Ark. 72150

Continuation-in-part of Ser. No. 520,014, Nov. 1, 1974. This application Dec. 26, 1974, Ser. No. 536,636

Int. Cl.² B60P *7/14*

U.S. Cl. 214—10.5 D **6 Claims**

3. In an inflatable paper plastic dunnage bag of the type having an air valve extending between the inside and the outside thereof, the improvement of means to prevent dry burn of the plastic bladder opposite and adjacent to the valve, said means comprising:

porous sheet form means of discrete thickness forming restricted air passage means and having a bonded annular joint connecting the sheet form means to the plastic bladder outwardly of the air valve so that said sheet form means extends over the air valve outlet,

said sheet form means forming a porous bubble surface in response to the air flow therethrough for expanding the stream of air from the valve and dissipating its dynamic energy to charge the interior of the bag with a static supply of air at increased pressure.

3,944,085

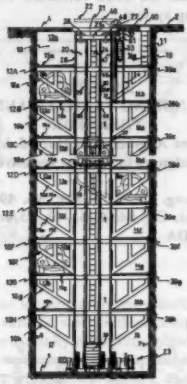
UNDERGROUND AUTOMATIC PARKING SYSTEM FOR VEHICLES

Alejandro Obregon, Horacio 543-403, Mexico City, Mexico

Filed Aug. 19, 1974, Ser. No. 498,520

Int. Cl.² E04H *6/06*

U.S. Cl. 214—16.1 C **18 Claims**



1. An underground automatic parking system for vehicles which comprises a vertical well means, said vertical well means being longitudinally divided into two elongated vertical side parking compartments comprising a plurality of parking levels having two parking spaces each, and a central vertical elevator shaft extending between said parking compartments throughout the height of said well means and having an eccess opening at ground level; an elevator means arranged within said elevator shaft; a hoist means engaged to said elevator means in order to move the same between an upward position and a downward position within said elevator shaft; a movable supporting slide means in each parking space, said slide means comprising a rectangular frame supported by two side headers, said side headers having a triangular form with horizontal, vertical and inclined members, said inclined member of said headers comprising a flange having upper and lower inclined plane cam surfaces engageable by cam means arranged in said elevator; a corresponding plurality of vehicle carrying platforms, said platforms being supported on the rectangular frames of said supporting slide means; a pair of horizontal track means arranged along the edges of each parking level of said well means; a plurality of rollers pivotally engaged to each of said headers of the supporting slide means and arranged in rolling relationship with said track means such that the slide means may be horizontally displaced between a retracted position within a parking space and an extended position within said elevator shaft; cam means at each end of said elevator means arranged in a position such that said cam means will be capable of engaging said lower inclined plane cam surface of one of said flanges during the ascending movement of the elevator means, in order to displace a corresponding slide means from its retracted to its extended position; cam releasing means in said cam means to release said lower inclined plane cam surface of said flange during the ascending movement of the elevator means when said slide means reaches its extended position, said cam releasing means being capable of catching said upper inclined plane cam surface of said one flange during the descending movement of the elevator means to cause engagement of said cam means on said upper surface in order to displace said corresponding slide means from its extended position to its retracted position; slide retention means capable of maintaining said slide means in its retracted position fully clearing said elevator shaft and of releasing said supporting slide means and displacing the same a short distance towards said elevator shaft so as to

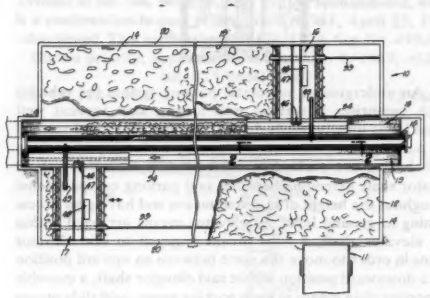
intercept the path of one of said cam means of the elevator means during movement thereof; a vertically movable cover at the access opening of said elevator shaft; cover lifing means in said elevator means for catching said cover and lifting it to a suitable height above the ground level to permit free access of a vehicle into the elevator means; and sequence programming logic means to sequentially effect all the actions of the elevator means and the slide retention means to properly operate the parking system.

3,944,086

MATERIAL HANDLING FACILITY AND APPARATUS THEREFOR

James O. Frisz, Los Angeles, and Harold A. Price, Anaheim, both of Calif., assignors to Watson Industrial Properties, Los Angeles, Calif.

Filed Aug. 19, 1974, Ser. No. 498,762
Int. Cl.² B65G *65/42*, *65/46*
U.S. Cl. 214—17 DA **4 Claims**



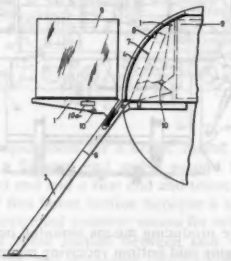
1. A material transferring facility, comprising:
walls defining an elongated open-topped pit having an open long side, said material being located in said pit;
a belt conveyor located outwardly of the pit and extending generally parallel along the pit open long side;
tracks located in said pit and extending lengthwise thereof;
a wheeled framework mounted on said tracks and adapted for movement along said tracks, said framework including a portion defining a space above the tracks and opening toward the materials in a forward direction of framework movement;
a screw feeder mounted on said framework and extending within said framework space transversely of said tracks with an end thereof lying outside the pit and over the belt conveyor throughout the complete path of movement of said framework along said tracks;
means carried by said framework for rotating said screw feeder in such direction as to transfer the material from the pit and out the end of said screw feeder onto the belt conveyor;
at least one vertically moving closed-loop chain carried by said framework maintained in contact with said materials, fingerlike members pivotally mounted to said chain, and means for camming said members to extend away from said chain into the materials during a part of their movement through the materials; and
means for selectively driving said closed-loop chain.

3,944,087

ON-BOARD FREIGHT LOADING DEVICE FOR AIRCRAFTS

Gunther Mölter, Ottobrunn, and Christoph Schubert, Zorneding, both of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Aug. 9, 1974, Ser. No. 496,152
Claims priority, application Germany, Aug. 14, 1973, 2341057
Int. Cl.² B60F *1/46*
U.S. Cl. 214—75 R **6 Claims**



1. In an on-board freight loading device for aircraft, particularly for large aircraft, which transport large containers for containerized freight, said aircraft having mutually perpendicular *x* and *y* axes, said *x*-axis being parallel to the longitudinal axis of said aircraft and said *y*-axis being perpendicular to said *x*-axis in the direction of the wings of said aircraft, said aircraft also having a lifting platform for receiving said freight, said lifting platform being lifted approximately from the ground level to the level of the freight room floor of said aircraft, said platform being moved between a pair of beams which are swingable between a storage position within the aircraft fuselage and an operating position inclined to the vertical outside of said aircraft, the improvement comprising wherein said pair of beams are parallel to one another when in said operating position and are hingedly secured in their upper zone to said aircraft, each of said pair of beams having further hinged joint means intermediate the ends thereof for permitting a movement of the lower zone of said beams from the operating position first into a position parallel to the *x*-axis against one another prior to their being swung into said storage position, the axes of said further hinged joint means each being parallel and contained in a vertical plane parallel to said *y*-axis of said aircraft.

3,944,088

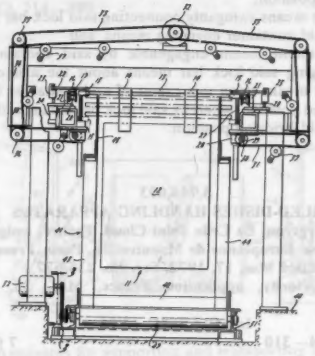
MACHINE AND PROCESS FOR HANDLING CATHODE PLATES OR THE LIKE

Cass S. Kasper, Grosse Point, Mich., assignor to Inter-Lakes Engineering Co., Mount Clemens, Mich.

Filed Mar. 3, 1975, Ser. No. 554,974
Int. Cl.² B65G *49/00*
U.S. Cl. 214—89 **9 Claims**

1. A workpiece handling machine comprising a pair of spaced parallel slide rails, means for intermittently advancing and accumulating a group of workpieces suspended between said rails, a bolster for receiving said workpieces, means for conveying said bolster between a loading position between and below said rails and a second position longitudinally spaced from and clear of said rails, and means supporting said rails for simultaneous vertical movement between an upper position in which the workpieces may be advanaced thereon

by said advancing means, and a lower position in which said workpieces are loaded onto said bolster and said rails are

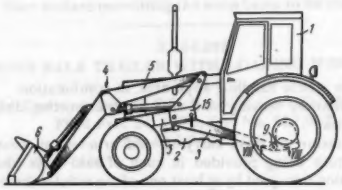


below the lowermost workpiece portions resting on said bolster.

3,944,089
LOADER

Valery Andreevich Polyanin, ulitsa Kirova, 41, kv. 66; Anatoly Jurievich Berkovich, ulitsa Dimitrova, 39, kv. 13; Georgy Vasilievich Zabegalov, Lenskaya ulitsa, 9, kv. 12, and Jury Konstantinovich Soin, Savinskaya naberezhnaya, 5, kv. 29, all of Moscow, U.S.S.R.

Filed Sept. 9, 1974, Ser. No. 504,234
Int. Cl.² E02F *3/72*
U.S. Cl. 214—131 A **5 Claims**

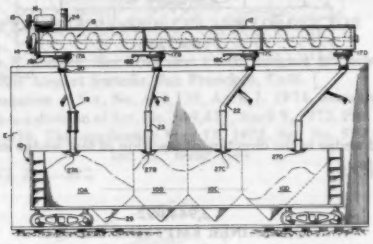


1. A loader comprising a wheeled tractor provided with a body and front and rear axles; said body having a fore- and aft-axis; a load-handling equipment having a frame and being mounted on the body of said tractor by means of said frame; said frame including side members and a cross member; said side members consisting, each, of two parts; one pair of said side members being interconnected by said cross member and carrying said load-handling equipment, said cross member having a single support on said tractor body; said support of said cross member being defined by a cylindrical bar located along the fore- and-aft axis of the tractor body and secured with a provision for axial movement in a horizontal plane relative to the tractor body to allow the removal from the tractor of the parts of said side members carrying the load-handling equipment; another pair of said parts of the side members being hingedly mounted on said rear axle of the tractor on both sides of said tractor body; and a locking device for a rigid fastening and separation of said parts of the side members.

3,944,090
METHOD FOR LOADING GRAIN CARS

Donald S. Flood, Maidstone, Canada, assignor to Robert J. Flood, Maidstone, Canada, a part interest

Filed Oct. 4, 1974, Ser. No. 512,089
Int. Cl.² B65G *67/06, 67/20*
U.S. Cl. 214—152 **1 Claim**



1. A method for loading grain into multiple compartments of a bulk carrier vehicle, said method comprising: positioning a substantially horizontally extending cylindrical auger tube at a location above said compartments, said tube having a grain receiving opening at one end thereof and having grain discharge openings in the lower side thereof above each compartment, each discharge opening having connected thereto a down spout for delivering grain from the auger tube into said compartments, positioning said down spouts such that the lower end of each extends a short distance into an associated compartment, feeding grain from a grain elevator into said auger tube receiving opening, rotating an auger within said tube to displace the grain along the tube away from the receiving opening and into said down spouts to load the compartments, continuing the loading such that as each compartment is filled to the level of the bottom of the associated down spout, the spout is left in position whereby the spout fills with grain up to the auger tube thereby precluding any further discharge of grain into the compartment while the discharging continues into the remaining compartment or compartments, this loading being continued until an amount of grain no more than the maximum specified load for the vehicle has been loaded, thereafter with no grain being fed to the auger tube, lifting the lower end of each down spout to allow the grain plugging each spout to flow into the associated compartments, and removing the emptied spouts.

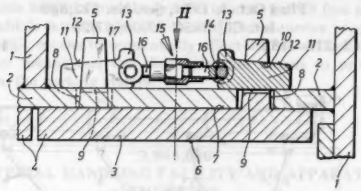
3,944,091
SECURING MEANS OF REPLACEABLE WEARING PLATES IN SMASHING MACHINES

Josef Tillmanns, Dusseldorf, Germany, assignor to Lindemann Maschinenfabrik GmbH, Dusseldorf, Germany

Filed Jan. 27, 1975, Ser. No. 544,314
Claims priority, application Germany, Feb. 9, 1974, 2406205
Int. Cl.² B02C *13/282*
U.S. Cl. 241—285 A **3 Claims**

1. In a material smashing machine including a housing wall, a plurality of replaceable wearing plates, and a plurality of releasable fixing means securing said wearing plates to said housing wall whereby said wearing plates from a stationary wearing wall, lining a portion of said housing wall, with the stationary wall forming the surface against which material is smashed, each of said releaseable fixing means comprising means defining an opening in said housing wall, an eyelet projecting from one of said wearing plates outwards through said opening in said housing wall, and a wedge inserted into said eyelet and bearing against the outside of said wall to hold said one wearing plate against said housing wall, and each of said wearing plates having at least one said eyelet, the im-

provement wherein each of said releaseable fixing means includes a releaseable self-locking clamping piece acting on



said wedge in the direction of insertion of said wedge into said eyelet.

3,944,092

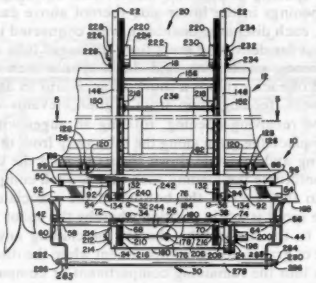
CONTAINER EMPTYING DEVICE

Franklin D. Ebeling, and Ernest C. Ebeling, both of 1608 W. 24th St., Plainview, Tex. 79072

Continuation of Ser. No. 471,845, May 21, 1974, abandoned. This application Feb. 3, 1975, Ser. No. 546,277

Int. Cl.² B65F *3/02*

U.S. Cl. 214—302 **6 Claims**



1. In combination with a vehicle having a power supply means and an elevated access opening, apparatus for emptying the contents of a refuse container into the vehicle through the elevated access opening, which apparatus comprises:

a. a refuse container having axially aligned support abutment means provided thereon transversely thereof,

b. elevator means including an endless carrier for raising and lowering said container,

1. said elevator means having an upper end adjacent said elevated access opening and a lower end adjacent a surface supporting said container,

c. means connecting said elevator means to said power supply means to move at least said lower end of said elevator means over said surface between a first position closely adjacent said vehicle and a second position spaced outwardly from said vehicle and closely adjacent said container,

d. container-engaging means connected to said endless carrier, whereby said container engaging means is inverted upon guided movement along a curved portion of said upper end of said elevator means, said container engaging means mechanically engaging the support abutment means on said container when said elevator means is moved to said second position by said power supply means, said container-engaging means including a U-shaped member having an open throat, and locking means for automatically locking said support abutment means to said container engaging means so that said container will remain in connected relationship with said container-engaging means when said container is tipped toward said elevated access opening to empty said container, said locking means including,

1. lock bar means for bridging said open throat, when in one position,

2. shaft means swingably connecting said lock bar means to said container engaging means, and

3. abutment means engageable by said container for swinging said lock bar means about the axis of said shaft means upon movement of said container to said tipped position, whereby said lock bar means will move to said bridging position.

3,944,093

SOILED-DISHES HANDLING APPARATUS

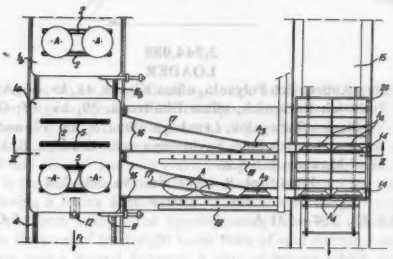
Maurice Bergeron, La Celle Saint-Cloud, France, assignor to Compagnie Europeenne de Manutention, Paris, France

Filed Mar. 17, 1972, Ser. No. 235,677

Claims priority, application France, Mar. 23, 1971, 71.10111

Int. Cl.² B65G *47/06*

U.S. Cl. 214—310 **7 Claims**



1. In an article handling apparatus, in combination:

a horizontally moving conveyor for transporting dish-like articles,

a succession of trays carrying said articles, at least one aperture being provided in each of said trays under a location occupied by at least one of the articles thereon,

at least one tray unloading station below said conveyor and at said station a movable pick up member normally lying below said conveyor adapted to pass through said aperture for lifting and ejecting an article lying horizontally thereon by a combined tilting and lifting movement to an elevated point above said station,

means for actuating said pick up member,

a stop member for stopping each tray above said station,

switch means actuated by the leading edge of each tray for making said stop member stop said tray and for actuating said pick up member to pass through said aperture when said tray is stopped,

said switch means being actuated by contact with said pick up member when same returns below said conveyor to cause said stop member to be retracted from the path of a stopped tray to allow the next tray to take its place below said station, and

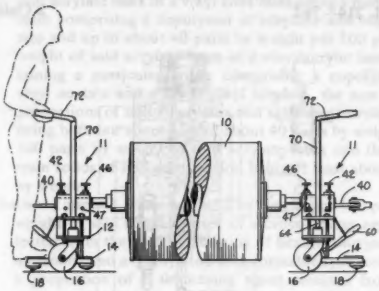
an inclined guide track at said elevated point for receiving articles ejected from said tray and including a guide member for bringing said article to a vertical position, and an underlying conveyor receiving said article in vertical position.

3,944,094

WARP BEAM DOLLY

Ralph M. Compton, 4 Briarcreek Place, Greenville, S.C. 29607

Filed Jan. 8, 1975, Ser. No. 539,342
Int. Cl.² B60P 3/00
U.S. Cl. 214—390 9 Claims



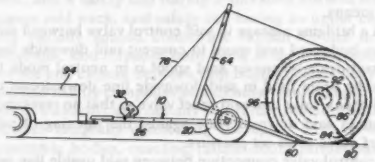
1. Apparatus for supporting and transporting a warp beam and the like comprising:
   a. a pair of wheeled frame support members;
   b. each of said support members including:
      i. a cross-frame bottom portion having an upper platform with roller members carried thereon,
      ii. a lower transverse platform having roller members carried thereon carried by and spaced vertically below said upper platform,
      iii. an upwardly extending housing carried on said upper platform defining a horizontally extending slot therein,
      iv. a cradle member for receiving an end of a warp beam axle slideably carried in said slot for vertical displacement; and
      v. means carried on said lower platform engaging a surface of said cradle member for raising and lowering said cradle member in said slot; and
   said support members being attached to the ends of the warp beam axle so as to support the warp beam above the floor surface permitting the warp beam to be transported.

3,944,095

ROUND BALE TRAILER WITH LOADING WINCH AND BRIDLE

Robert Lawrence Brown, P.O. Box 47A, Orrville, Ala. 36767

Filed Feb. 24, 1975, Ser. No. 552,067
Int. Cl.² B60P 1/28
U.S. Cl. 214—506 8 Claims



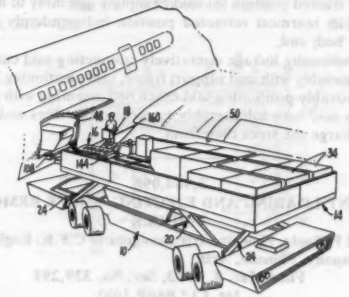
1. A round bale loading and transport vehicle comprising a mobile frame, a generally horizontal load bed pivotally mounted on said frame for tilting between a generally horizontal transport position and an inclined position with a first lower marginal edge of said load bed at least closely adjacent the support surface upon which said vehicle is supported, an adjustable length flexible bridle including a pair of elongated spikes having one pair of corresponding end portions anchored to the opposite ends of said bridle and a second pair of corresponding end portions adapted to be lengthwise inserted into the central areas of the opposite axial ends of a round bale, an elongated flexible tension member including one end removably anchorable to the mid-portion of said bridle, said transport including pull means engaged with the other end portion of said tension member operative to apply a lengthwise generally horizontal pull on said tension member at an elevation above said load bed toward a second marginal edge portion of said load bed remote from said first marginal edge.

3,944,096

FREIGHT TRANSPORTER AND LOADER FOR AIRCRAFT

Victor H. Carder, San Francisco, Calif., assignor to Cochran-Boothe Airport Systems, San Francisco, Calif.

Continuation of Ser. No. 454,739, April 1, 1974, abandoned, which is a division of Ser. No. 349,417, April 9, 1973, Pat. No. 3,854,610. This application May 15, 1975, Ser. No. 577,699
Int. Cl.² B60P 1/44
U.S. Cl. 214—512 4 Claims



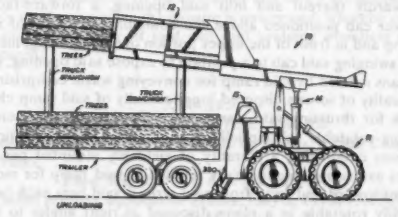
1. A freight unit transporter and loader vehicle for aircraft comprising a freight unit support bed, conveyor means carried by the bed for the movement of freight units along the bed, a support bed extension unit connected to the support bed, means to connect the extension unit to a loading doorway of an aircraft, conveyor means carried by the extension unit to enable the transfer of freight units from the extension unit into the aircraft, and means for horizontally pivotally swinging the extension unit relative to the support bed whereby the extension unit may be disposed normal to the aircraft doorway while the support bed may be disposed parallel to a trailing edge of a wing of the aircraft.

3,944,097

TREE TRANSPORTING VEHICLE

Donald D. Savage, Marietta, Ga., assignor to B. J. Powell, Atlanta, Ga., a part interest

Filed Feb. 5, 1974, Ser. No. 439,737
Int. Cl.² B60P 1/02
U.S. Cl. 214—514 20 Claims



1. A tree transporting vehicle comprising:
   a base subassembly having a support frame and ground engaging means for moving said base subassembly;

a catch bed assembly for receiving the trees to be transported and supporting the trees therein above said base subassembly, said catch bed assembly including:

a carriage frame;

a catch bed movably carried by said carriage frame and defining a tree receiving chamber therein with open front and rear ends and an open top;

a heel plate assembly movably carried by said carriage frame and extending into said tree receiving chamber;

tie means interconnecting said bed and said heel plate assembly so that said heel plate assembly is moved with said bed as said bed is moved forwardly in said carriage frame but said bed moves rearwardly in said carriage frame independently of said heel plate assembly; and,

interlock means operatively connecting said carriage frame, said bed and said heel plate assembly to selectively lock said heel plate assembly in its forwardmost position and to release said heel plate assembly from its locked position when said bed is in its rearmost retracted position for said heel plate assembly to move to its rearmost retracted position independently of said bed; and,

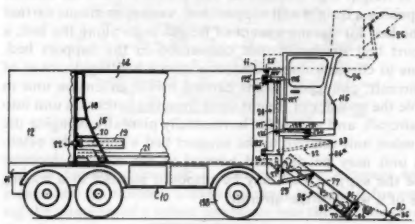
a positioning linkage operatively connecting said catch bed assembly with said support frame, said positioning linkage movably positioning said catch bed assembly with respect to said base subassembly to receive the trees and to discharge the trees therefrom.

3,944,098

FRONT LOADING AND EJECTING WASTE REMOVAL VEHICLE

Alfred F. Foote, Phoenix, Ariz., assignor to C.F.K. Engineering Company, Phoenix, Ariz.

Filed Mar. 8, 1973, Ser. No. 339,291
Int. Cl.[2] B60P *1/00*
U.S. Cl. 214—519 6 Claims



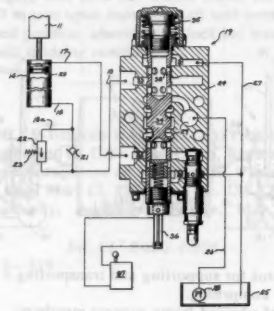
1. In a waste pickup and ejecting vehicle having a waste container with an opening therein at the front of said vehicle, and means in said container for ejecting waste through said opening, the combination of a waste-receiving channelled ramp having its upper end communicating with the lower portion of said opening and its lower end extending forwardly of the latter, means carried by said ramp for conveying waste upwardly thereof and into said opening, a forward-facing driver cab positioned above the communicating end of said ramp and in front of the upper portion of said opening; means for swinging said cab to a position to expose said opening; said means carried by said ramp for conveying waste comprising a plurality of screws disposed longitudinally of said ramp channels for thrusting said waste upwardly thereof, said screws being rotatable substantially in a common plane; additional means comprising a plurality of yieldably mounted parallel bars extending longitudinally relative to said ramp for movement toward and away from said screws, said bars each being bodily rotatable in a plane disposed at right angles to said common plane, and means for rotating alternate bars successively into engagement with said waste to thrust the latter upwardly toward said opening whereby a convergent thrust is produced to supplement the upward thrust of said screws.

3,944,099

LOAD HOLDING DEVICE FOR MOBILE POWER CRANE EXCAVATORS AND THE LIKE

Robert A. Gohr, Pulaski, Wis., assignor to Northwest Engineering Company, Green Bay, Wis.

Filed Mar. 4, 1974, Ser. No. 447,931
Int. Cl.[2] F02F *3/84*
U.S. Cl. 214—762 2 Claims



1. In a material handling apparatus having a load carrying member under the influence of gravity or the like, a control system comprising:

a. a double acting cylinder connected to said load carrying member for raising and lowering the latter,

b. a control valve connected to a drain and comprising a valve body having a spool therein,

c. means to shift said spool between a neutral load holding mode and load raising and load lowering modes,

d. upside and downside fluid lines disposed between said valve body and the respective upside and downside ends of said cylinder,

e. said downside line being closed to said drain when said spool is in load raising mode, and being open to said drain when said spool is in load lowering mode,

f. a check valve and a relief valve disposed in parallelism in said downside line with said relief valve being responsive to a set pressure,

g. means to create a pressure in the said upside line which when added to the pressure caused by the weight of said load carrying member produces a total pressure in said downside line in excess of said set pressure for opening said relief valve, said pressurizing means being responsive to shifting of said spool out of neutral mode by said shifting means,

h. and a bridging passage in said control valve between said valve body and said spool to connect said downside line to said drain whenever said spool is in neutral mode to thereby drain fluid in said downside line downstream of said check valve and said relief valve so that no resistance exists in said downside line against the opening of said relief valve at its set pressure,

i. the control valve connection between said upside line and said drain being blocked when said spool is in both said load lowering and neutral modes.

3,944,100

CONTAINMENT COATING COMPOSITION

M. Clifford Brockway, Columbus, and Robert E. Sharpe, Worthington, both of Ohio, assignors to Liberty Glass Company, Sapulpa, Okla.

Filed Mar. 18, 1974, Ser. No. 451,824
Int. Cl.[2] B65D *23/00*; C08L *61/20*
U.S. Cl. 215—1 C 6 Claims

1. A glass container having adhered to the outside surface

thereof a cured coating, said coating being derived from curing of a coating composition comprising:

an acrylate latex, said acrylate latex containing a particulate resin comprising a copolymer of acryb nitrile and ethyl acrylate;

up to about 40 parts by weight per 100 parts by weight of said acrylate latex of a vinyl latex containing a particulate resin comprising a copolymer of ethylene and vinyl acetate and up to about 40 parts by weight per 100 parts by weight of said acrylate latex of a vinyl/acrylic latex containing a particulate resin comprising a copolymer of vinyl acetate and a lower alkyl acrylate, the sum of the proportions of said vinyl latex and said vinyl/acrylic latex being between about 15 and about 40 parts by weight per 100 parts by weight of said acrylate latex and the total resin solids of said composition being at least about 45% by weight;

between about 1.8 and 7.5 parts by weight per 100 parts by weight of said acrylate latex of a cross-linking agent selected from the group consisting of hexamethoxymethylmelamine and a methylated urea-formaldehyde resin; and a proportion of a thickening agent selected from the group consisting of polyacrylamide and a high molecular weight water-soluble polyethylene oxide resin sufficient to impart to said composition a Brookfield viscosity of between about 2,000 and 9,000 cps at 1 rpm and a Brookfield viscosity of between about 600 and about 2,400 cps at 5 rpm.

3,944,101

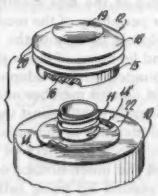
SAFETY CLOSURE

William James Landen, deceased, late of Cheshire, Conn., by Paulette S. Landen, executrix, 30 Fairwood Drive, Cheshire, Conn. 06410

Filed Apr. 16, 1974, Ser. No. 461,450

Int. Cl.² B65D *55/02, 85/56;* **A61J** *1/00*

U.S. Cl. 215—216 **10 Claims**



1. In combination, a bottle or the like having a threaded neck, and a safety cap having a threaded bore to removably engage said neck, said safety cap having an upper closed end with radially spaced concentric tubular bodies dependent therefrom, said threaded bore being in the inner tubular body and the end closure between said bodies being axially compliant, said axially compliant end closure comprising a relatively thin downwardly and radially outwardly sloped frusto-conical member integrally connecting the upper ends of both said concentric bodies, coacting ratchet-tooth formations including a circumferential succession of like equally spaced teeth at the lower end of said outer tubular member and at least two spaced teeth on said bottle or the like at the neck region of adjacency to the tooth formations of said cap when in secured position, said last defined spaced teeth being spaced by an amount which comprehends the spacing of a given plurality of teeth of said cap plus a fraction of the intertooth spacing of said cap, said fraction being substantially the reciprocal of the number of teeth on said bottle or the like, said ratchet formations being one-way engageable in the unthreading direction of cap rotation and escaping in the thread-advancing direction of cap rotation, the axial extent of compliant axial displacement of said concentric members exceeding the axial range over which ratchet action is realized, and the axial location of said threaded and ratchet regions of said cap and bottle or the like being such that said ratchet formations coact over at least the part of the axial range of threaded engagement at which full threaded engagement of said cap and bottle or the like is achieved, the outer wall of said outer tubular member circumferentially continuously surrounding all ratchet-tooth formations of said outer tubular member, whereby said formations are only axially downwardly exposed and therefore are concealed by the outer wall surface of said outer tubular member when said cap is secured to said neck.

3,944,102

SAFETY SCREW CLOSURE

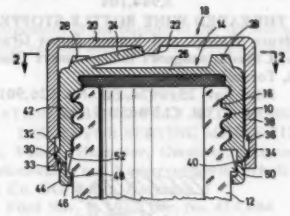
Hermann Grau, Schwabenstr. 296, 7071 Lindach (Baden-Wurttemberg, Bundesrep. Deutschl.), Germany

Filed Mar. 30, 1973, Ser. No. 346,582

Claims priority, application Germany, Apr. 5, 1972, 2216343

Int. Cl.² B65D *41/16, 43/02*

U.S. Cl. 215—251 **8 Claims**



1. The combination of a safety screw closure and a container having a threaded neck and an annular shoulder arranged below said threads, said closure comprising an inner and outer screw cap located one inside the other, said inner screw cap rotatable about said threaded neck in one direction to close thereon and in an opposite direction to open, said outer cap being rotatable with respect to said inner cap and axially slidable between an outer and inner position, a spring located between said caps to normally urge said outer cap into its axial outer position, said outer cap being movable against said spring into its inner axial position, means for cooperatively coupling said outer cap to said inner cap in any axial position for conjoint rotation with said inner cap in the closing direction and for cooperatively coupling said outer cap with said inner cap in its inner axial position for conjoint rotation with said inner cap in the opening direction, said inner cap having a securing ring attached at its lower end by at least one rupturable connecting bridge member, said securing ring being preshaped to conform to the shape of said annular shoulder, and being radially elastically expandable thereover, said securing ring and the inner cap being provided with intermediate cam members which cooperatingly abut when the closure is screwed on to the container and which are cooperatively ineffective when the closure is unscrewed, whereby only on initially opening of said cap said bridging members are ruptured.

3,944,103

TWO-PIECE PLASTIC CLOSURE

Modesto Cros, "Les Cedres", Route de Molles, 03300 Cusset, France

Filed May 2, 1974, Ser. No. 466,479

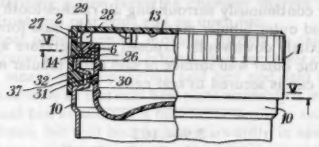
Claims priority, application France, May 2, 1973, 73.15683

Int. Cl.² B65D *51/18*

U.S. Cl. 215—277 **4 Claims**

1. Two-component plastic tight closure comprising on the one hand a cup-shaped bottom (4) adapted to be driven into the neck of a container, which comprises an annular flange

(6) surrounding its top edge, said flange (6) having formed on at least one portion of its lower annular surface a circular bead (26) and along its outer cylindrical edge locking means (25, 27) and on the other hand a cap (1) having a depending skirt



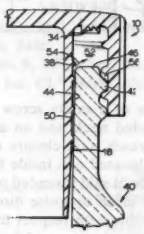
(2) adapted to fit on said cup-shaped bottom (4) and formed along the periphery of its top portion (13) with means (28) for abutting said flange (6) of said cup-shaped bottom and projections adapted to engage said locking means (25, 27) of said cup-shaped bottom.

3,944,104

THREADED WINE BOTTLE STOPPER

William Bruce Watson, and Vernon James Graves, both of Toronto, Canada, assignors to Consumers Glass Company Limited, Toronto, Canada

Filed Nov. 25, 1974, Ser. No. 526,901
Int. Cl.² B65D *51/16*
U.S. Cl. 215—307 **17 Claims**



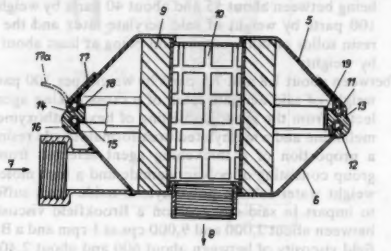
1. A threaded bottle stopper for engaging an externally threaded bottle neck to provide a controlled release of pressurized gases from a bottle, comprising: a cap having a disc portion with an annular skirt depending downwardly therefrom; a tubular body portion extending downwardly from and integral with the underside of said disc portion, the outside diameter of said tubular body portion being less than the inside diameter of said annular skirt where the longitudinal axis of said tubular body portion is coincident with the longitudinal axis of said annular skirt; an annular space being defined between the outside surface of said tubular body portion and the inside surface of said annular skirt; a continuous thread on the inside surface of said annular skirt; the outside diameter of said tubular body portion being such to permit insertion of said tubular body portion in a bottle neck bore; said continuous thread on said annular skirt adapted to engage a continuous external thread on a neck of a bottle whereby rotation of said threaded bottle stopper about its longitudinal axis in both directions moves said tubular body portion respectively into and out of the neck bore of the bottle; said bottle stopper having means for sealing the discharge opening of the bottle neck; said tubular body portion having gas release means on the outside surface thereof for controlling the release of pressurized gases from a bottle by providing at least one open-ended tortuous channel through which the pressurized gases pass before escaping to the atmosphere; said gas release means releasing pressurized gases from the bottle while said continuous thread on said annular skirt engages the external thread of the externally threaded bottle neck and subsequent to a breaking of said means for sealing the discharge opening of the bottle neck upon rotation of said threaded bottle stopper in the respective direction.

3,944,105

FLEXIBLE ANNULAR JOINT

Albert Chollet, Vevery, Switzerland, assignor to Etablissement Studia Technica, Vaduz, Liechtenstein

Filed July 29, 1974, Ser. No. 492,914
Claims priority, application Switzerland, July 31, 1973, 11151/73
Int. Cl.² B65D *7/12, 25/20*
U.S. Cl. 220—4 E **1 Claim**



1. In an assembly of first and second generally round members each having a wall terminating with an opening provided with an annular bead wherein the two beads define superimposable surfaces forming a joining plane, a flexible annular joint sealably joining the first and second members together, said joint having a constant cross-section along its entire length and including: a median part in the form of a circular crown adapted to be intercalated between the respective beads of the two members; a flange at the inner periphery of the median part, said flange being adapted to bear against the inner surface of the wall of the first member; and first and second lips at the outer periphery of the median part, the first lip being rounded to closely fit around the bead of said first member, and the second lip being of lesser thickness than the first and including a rounded portion adapted to fit around a part of the bead of said second member and a terminal skirt portion adapted to resiliently bear against the outer surface of the wall of said second member in the proximity of its bead, a second flange at the inner periphery of the median part adapted to bear against the inner surface of the wall of said second member, said second lip being sufficiently thin and flexible to permit removal of said second member, by outwardly folding the second lip, while the joint remains fitted on said first member, said second lip bearing conically against said second member, so that the joint is vacuum tight.

3,944,106

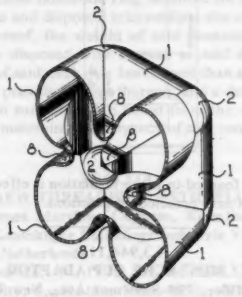
STORAGE TANK

Thomas Lamb, 3705 Riverwood Road, Alexandria, Va. 22309

Filed June 20, 1974, Ser. No. 481,302
Int. Cl.² B63B *25/08*; B65D *5/02, 7/42*
U.S. Cl. 220—5 A **16 Claims**

1. A cubical-shaped storage tank comprising 12 equal diameter and equal length portions of cylindrical shells, three of said shells forming each corner of said tank and four of said shells forming each side of said tank, said portions of the cylindrical shells being formed by removing an arc length section of the circumference of each of the cylindrical shells and also by removing that portion of the ends of each of the cylindrical shells defined by diagonally intersecting planes produced at both ends of the cylindrical shell portions resulting from the intersection of said three cylindrical shell portions placed perpendicular to each other at each corner forming a generally cubically shaped outer boundary, said intersecting cylindrical shell portions at each corner forming an aperture closed by spherically shaped caps forming a continu-

ous tank surface, said spherically shaped caps consisting of that portion of the surface of a sphere of equal diameter to that of the cylindrical shells, and said four cylindrical shell portions which make up each side of the cubical shape defining an aperture in the middle of each of said sides, said aperture being closed by four identical parts of a cylindrical surface connected together forming a closed cap, the base of said cap forming a continuous surface tangent with the aperture defined by said cylindrical shell portions and extending inwardly into said tank.



3,944,107

CLOSURE FASTENING MEANS

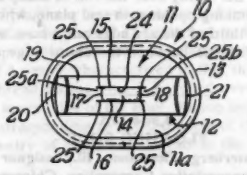
John Bernard Wallace, Ickenham, and Frederick William Ballard, Denham, both of England, assignors to TRW Inc., Cleveland, Ohio

Filed Jan. 13, 1975, Ser. No. 540,337

Claims priority, application United Kingdom, Jan. 17, 1974, 2303/74

Int. Cl.² B65D *45/16*

U.S. Cl. 220—326 **11 Claims**



1. A plug for closing an aperture in a panel comprising a generally flat metal plate adapted to cover the aperture in the panel, an undersurface on the plate, at least one boss in the undersurface of the plate defining at least two spaced sidewall portions, a resilient metal spring comprising a body portion attached to the undersurface of the plate and at least two resilient legs depending from the undersurface of the plate and adapted for snapengagement through the aperture in the panel, wherein the body portion is provided with at least two spaced edge portions in frictional engagement with the said at least two spaced sidewall portions of the boss to retain the spring and the plate together.

3,944,108

COLLECTOR BOX

Joseph Enik, 234 Globe St., Union, N.J. 07083

Filed Aug. 1, 1975, Ser. No. 601,210

Int. Cl.² B65D *25/24*

U.S. Cl. 220—18 **8 Claims**

1. A collector box comprising:

a. a receptacle,

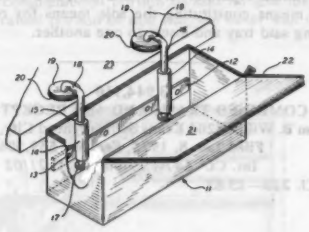
b. a rigid bar attached to the inside of the receptacle,

c. a hollow sleeve attached to the bar,

d. a generally vertical passage in the hollow sleeve,

e. a vertical support slidable and rotatable in the passage,

f. an offset arm extending generally perpendicularly to the vertical support at the top thereof,



g. a generally horizontal flat support at the end of the offset arm,

h. an enlargement in the bottom of the vertical support, to retain the vertical support in the vertical passage.

3,944,109

COMBINATION SERVING TRAY WITH REMOVABLE INSERT FOR SERVING MEANS

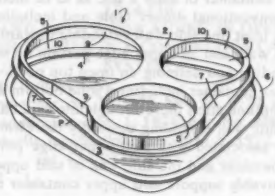
Heinz Holz, Velber, Hannover, Germany, assignor to FKF Berlin Fleischwaren und Konservenfabrik, Schulz & Berndt GmbH & Co. KG, Berlin, Germany

Filed Nov. 9, 1973, Ser. No. 414,604

Claims priority, application Germany, Nov. 9, 1972, 2255424

Int. Cl.² B65D *25/10, 3/24*

U.S. Cl. 220—20 **3 Claims**



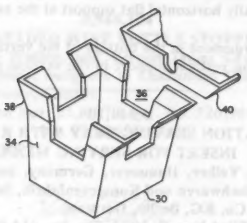
1. A serving unit comprising a tray having a continuous, planar base, said base constituting means for supporting containers of food, sides upstanding from said base, a flat ledge projecting outwardly from and extending circumferentially around the upper edges of the sides, and providing an inner depression at the junction of the upper edges of said sides and said edge a removable insert having a flat marginal portion circumferentially substantially co-dimensional with said inner depression, said ledge constituting means for supporting said insert on the inner depression of said ledge and when so supported providing with said ledge means for lifting said tray and insert together, said insert having a raised portion inwardly of said marginal portion and disposed above the marginal portion, said raised portion being formed with a plurality of openings therethrough, at least one of said openings being of different dimensions than the others, said openings constituting means for receiving containers of food to be supported upon the base of the tray, the marginal edges of said openings being constituted as means inhibiting movement of containers inserted in said openings across the base of the tray, said depression of said ledge and said marginal portion being formed with recess and projecting means said recess and projecting means constituting horizontal interfitting means between said tray and insert, said insert being deformable for moving said marginal portion into and out of interfitting engagement with said

ledge for releasably securing said tray and insert to one another, said raised portion of said insert extending upwardly from said marginal portion at selected locations spaced sufficiently inwardly of the projecting means thereof to constitute said marginal portion at such positions as flat gripping means for lifting said insert by a user thereof and for facilitating its manipulation separately from said tray, said horizontal interfitting means constituting the sole means for releasing and securing said tray and insert to one another.

3,944,110
COMBINED TRASH AND ASH RECEPTACLE

William B. Willis, 3204 Evans St., Morehead City, N.C. 28557

Filed Jan. 8, 1975, Ser. No. 539,506
Int. Cl.² A47G *19/00*; B65D *21/02*
U.S. Cl. 220—23.83 **3 Claims**



1. A receptacle for separately receiving tobacco ashes and trash in a single article of manufacture comprising:

a. a base container of such a size as to fit inconspicuously on a conventional dinner table and including a bottom wall, at least one side wall extending upwardly from said bottom wall, and an upper edge portion on said side wall surrounding and defining an open top portion;

b. an upper container including a solid bottom wall preventing communication therethrough into said base container and a side wall extending upwardly therefrom;

c. means associated with said upper edge portion of said base container and the side wall of said upper container to removably support said upper container on said base container;

d. at least one access opening in said side wall of said base container, said access opening including a relatively wide opening extending from said upper edge downwardly a distance such that an opening of sufficient size to receive table trash therethrough is formed below the bottom wall of said upper container when in an assembled position on the upper edge of said base container;

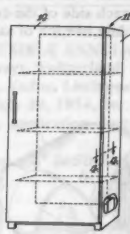
e. at least the bottom wall of said upper container being formed of a material which is heat resistant to live cigarette, cigar, or pipe ashes.

3,944,111
FREEZER LINER CONSTRUCTION

Clyde Joseph Nonomaque, Fort Smith, Ark.; Harry Lucian Tillman, and Kenneth L. Hortin, both of Evansville, Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 4, 1974, Ser. No. 520,642
Int. Cl.² B65D *87/34*; F25D *23/06*, *23/08*
U.S. Cl. 220—63 R **15 Claims**

1. A liner construction for use in a cabinet having insulation foamed-in-place about the outer surface of the liner, comprising: a liner formed of synthetic resin; a foam release material covering substantially the entire outer surface of the liner; and securing means attached to said foam release material at preselected positions for securing the foamed-in-place insulation to the foam release material at said preselected positions

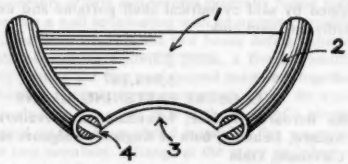


whereby said foamed-in-place insulation is effectively secured to the liner at said preselected positions.

3,944,112
MUSTACHE CUP ADAPTOR

George W. Miller, 799 Shawmut Ave., New Bedford, Mass. 02746

Filed Feb. 3, 1975, Ser. No. 546,561
Int. Cl.² A47G *19/22*
U.S. Cl. 220—90.2 **1 Claim**



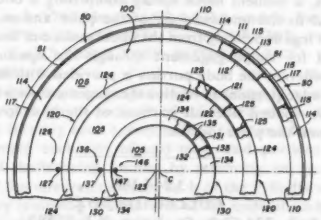
1. An adaptor which converts a conventional drinking cup to a moustache cup comprising a segmental shaped flat thin plane of flexible material bounded by a slit lengthwise tubular arc edge which fits tightly over the rim of a cup and

an arcuate drinking opening, in said plane, whose length is the middle third of the arc edge and whose width is one-third the distance between the chord edge and the arc edge.

3,944,113
FLOATING ROOF

Milton W. Heisterberg, Flossmoor, Ill., assignor to General American Transportation Corporation, Chicago, Ill.

Filed Nov. 18, 1974, Ser. No. 524,575
Int. Cl.² B65D *87/18*
U.S. Cl. 220—219 **17 Claims**



1. A floating roof for covering liquids stored in storage tanks or the like wherein the roof floats on the stored liquid, said roof including a deck generally conforming to the horizontal cross-sectional shape of the associated storage tank and having transverse dimensions and a thickness such as to cause said

deck to be flexible, a pontoon around the outer periphery of said deck and secured thereto for imparting buoyancy to said roof to float said roof upon the surface of the stored liquid, said deck having an upper surface and a lower surface in contact with the stored liquid to prevent evaporation therefrom and to prevent contamination thereof, and a hermetically sealed hollow floatation ring mounted on said deck and secured thereto and disposed intermediate the center and the outer edge thereof, the weight of said floatation ring being asymmetrically disposed with respect to said deck so as to place an area of said deck at a lower level than all other areas of said deck to provide a sump thereon, and a drain communicating with said sump to drain liquid from the upper surface of said deck to maintain the buoyancy of said roof at all times.

3,944,114

SCREW THREADED PLASTIC PLUG

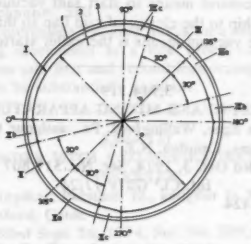
Matheus Johannes Martinus Coppens, Kalmthout, Belgium, assignor to Koninklijke Emballage Industrie Van Leer B.V., Amstelveen, Netherlands

Filed Mar. 14, 1975, Ser. No. 558,323

Claims priority, application Netherlands, Mar. 20, 1974, 7403762

Int. Cl.² B65D *41/04*, *41/34*

U.S. Cl. 220—288 **8 Claims**



1. Plug of plastic or another rather soft material provided with external screw thread and adapted to be screwed in a metal neck provided with internal screw thread, especially in a closure of a vessel, characterized in that the first thread of the screw thread on the plug is bevelled over 360° by coneshaping the lower edge of the plug, the top angle of the bevelling cone corresponding to the top angle of the reamer, with which the entry of the screw thread in the neck has been reamed.

3,944,115

CONTAINER AND LID STRUCTURE

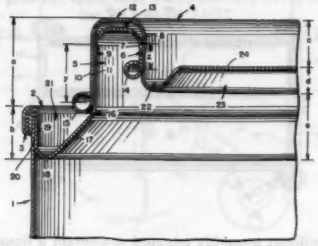
William Moonan, Shaker Heights, Ohio, and John D. Czarnecki, Downers Grove, Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed Nov. 7, 1974, Ser. No. 521,749

Int. Cl.² B65D *43/10*

U.S. Cl. 220—355 **3 Claims**

1. A container and a lid for closing said container, said container having a rim, said rim having a raised portion spaced inwardly of the side wall of the container, said raised portion being of an inverted U-shape which comprises an outer vertical wall and a spaced inner vertical wall connected by a transversely extending top portion, said outer vertical wall being longer than said inner vertical wall of said raised portion of said rim, the lower end of said outer vertical wall of said raised portion extending downwardly and outwardly toward the inner surface of said container in a straight line at an angle of approximately 45° to the vertical and then upwardly along a vertical wall of said container, the lower end of the inner vertical wall of said raised portion of said rim terminating in a bead extending inwardly with respect to said raised portion, said lid having a complemental portion adapted to overlie and continuously frictionally engage the vertical walls of said raised portion of said rim, the friction engaging surfaces between the outer wall of said complemental portion of said lid and the outer wall of said raised portion of said rim being longer than the friction engaging surfaces between the inner wall of said complemental portion of said lid and the inner wall of said raised portion of said rim, the outer wall of said



complemental portion of said lid terminating in a bead extending outwardly, said bead on the outer wall of the complemental portion of said lid extending to a point just short of the juncture of said outer vertical wall of said raised portion of said rim and said downwardly and outwardly extending portion of said rim, and the inner wall of said complemental portion of said lid extending downwardly beyond said bead at the inner end of said raised portion of said rim.

3,944,116

PROCESS AND DEVICE FOR AIDING IN OPENING THE TUNDISH NOZZLE IN A CONTINUOUS CASTING SYSTEM

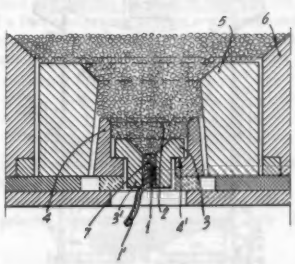
Luigi Danieli, Buttrio, Italy

Continuation of Ser. No. 307,978, Nov. 20, 1972, abandoned. This application Apr. 1, 1974, Ser. No. 456,610

Claims priority, application Italy, May 5, 1972, 23956/72

Int. Cl.² B22D *37/00*, *41/10*

U.S. Cl. 222—1 **3 Claims**

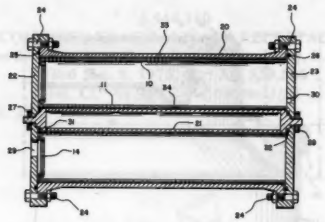


1. The process of closing a nozzle hole in the bottom of a tundish used in pouring molten steel, comprising the steps of inserting a rolled up and pressed asbestos bead into the nozzle hole with an end of the bead extending out of the nozzle hole in a position to be grasped by an operator, applying a finely divided chrome compound into the nozzle hole adjacent the closure and at least partially filling the bottom of the tundish, said chrome compound having a sintering temperature of on the order of at least 1740° C.

3,944,117
ROLLONET ASSEMBLY

Robert A. Gould, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 811,696, March 26, 1969, abandoned. This application Apr. 18, 1975, Ser. No. 570,123
Int. Cl.² B65D *35/28*
U.S. Cl. 222—95 5 Claims

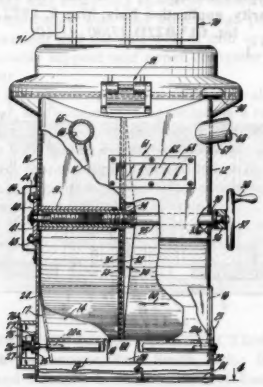


1. A rollonet assembly adapted to contain a liquid therein comprising;
a cylindrical outer member;
supporting means surrounding said outer member;
an inner member;
an inner support member for maintaining said inner member in spaced relationship with said outer member;
said inner member being releasably attached to said supporting means along the entire length of said inner member; and
an end member connecting one end of said outer member and inner member impervious to fluids.

3,944,118
THERMOPLASTIC RESIN PELLET RATIO LOADER

Sidney W. Trill, 25 Montrose Road, Scarsdale, N.Y. 10583

Filed May 13, 1974, Ser. No. 469,510
Int. Cl.² B65D *47/00*; B65G *53/36*
U.S. Cl. 222—134 8 Claims

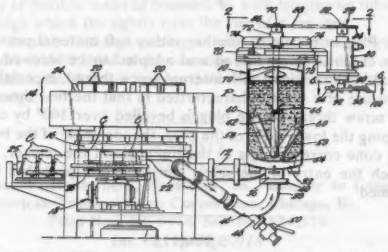


1. A ratio unit loader having means to connect said loader to the hopper of a thermoplastic resin processing machine, a set of connected side walls forming an enclosed container, a bottom orifice in said container, a movable flap having opened and closed positions and covering said orifice in its closed position and opening to uncover said orifice in its open position, uniform mixture means to form separate piles from two different reservoirs of thermoplastic resin to the same predetermined level within said container and to flow the said two resins after the said flap is opened in a uniform simultaneous flow from said two piles within said container to provide a uniform mixture to said processing machine, said uniform mixture means including, a single substantially verticially oriented separation wall within said container which separates the two said piles of thermoplastic resin and forms two volumes within said container, a first and a second conduit each having a fixed opening into only one of said volumes and each being connectable to different reservoirs of said two reservoirs of thermoplastic resin, movement means to move said separation wall sidewise to select the ratio of the said two resins in said mixture and to determine the size of the outlets through which the said resins will discharge, said movement means including a handle outside of said container to move said separation wall sidewise to form a proportionally smaller outlet to discharge the lesser amount of the two said resins and at the same time to form a larger outlet to simultaneously discharge the greater amount of the two said resins, means to apply vacuum to within the two said container volumes and bring the said two resins on opposite sides of said separation wall to substantially said same predetermined level before said flap is opened, a timer means to control the timing of said vacuum means to continue said vacuum until said predetermined substantially equal level is obtained and thereafter to stop said vacuum means, whereby after the flap is opened the two resins commence and finish flowing substantially at the same time to provide a uniform mixture to said processing machine, and control means to start said vacuum means in timed relationship to the closing of said flap so that upon said flap closing the vacuum means is thereafter started.

3,944,119
FEEDING AND MIXING APPARATUS

Walter Warren Egee, Wallingford, Pa., assignor to Campbell Soup Company, Camden, N.J.

Filed Oct. 3, 1974, Ser. No. 511,807
Int. Cl.² G01F *11/28*
U.S. Cl. 222—424 16 Claims

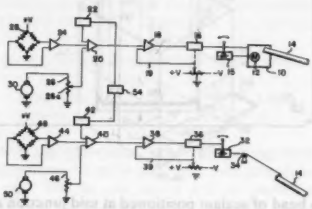


1. A feeding and mixing apparatus for generally fluent material including components having different specific gravities, said apparatus comprising a supply hopper adapted to contain a supply of said material, said supply hopper including a discharge opening adjacent its lower end for communicating with a supply conduit adapted to deliver said material to an associated device and further including an inlet opening also adjacent its lower end and the discharge opening for communicating with the delivery end of said supply conduit, first and second mixing tube means rotatably mounted in said supply hopper, said first mixing tube means communicating with said inlet opening and with a portion of the interior of said supply hopper above the lower end whereby said first mixing tube means is operative to stir said material within said supply hopper and recirculate material between said delivery end of said supply conduit and said supply hopper, said second mixing tube means communicating with different interior portions of said supply hopper whereby said second mixing tube means is operative to stir and recirculate said material within said supply hopper.

3,944,120
CONSTANT TENSION LOAD-TRANSFERRING APPARATUS AND METHOD

Duncan Bell, Everett; Donald A. Swanson, Lynnwood, and John P. Veale, Kirkland, all of Wash., assignors to Western Gear Corporation, Everett, Wash.

Filed July 24, 1974, Ser. No. 491,314
Int. Cl.² B65H 17/42
U.S. Cl. 226—4 11 Claims



7. A method for shifting tension loads between two load-transporting mechanisms, comprising;

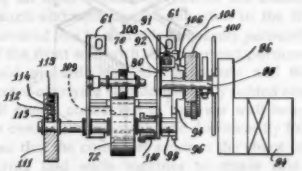
gradually reducing the load forces on a first load-transporting mechanism; and

gradually increasing the load forces on a second load-transporting mechanism at a rate which causes the total forces on said first and second load-transporting mechanisms to be substantially constant.

3,944,121
BOOKBINDER WITH A DAMPED-ADHESIVE STRIP INSERTER

Robert A. Hayskar, Palatine, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 26, 1974, Ser. No. 509,580
Int. Cl.² B65H 17/22
U.S. Cl. 226—136 6 Claims



1. Apparatus for providing a metered length of adhesive bearing strip, from a supply roll of adhesive bearing strip, to a mechanism for fixing the metered length of adhesive bearing strip to an edge of a stack of sheets, comprising:

a. a first roller rotatably coupled to the mechanism;

b. a second roller coupled by a one-way clutch to a shaft rotatably coupled to the mechanism, the adhesive bearing strip being engagable with a nip provided by the first and second rollers;

c. abutment means for limiting rotation of the shaft from a start-of-feed position to a direction which causes engagement with the one-way clutch;

d. drive means for rotating the shaft to drive the second rollers a predetermined amount, thereby providing the metered length of adhesive bearing strip when said strip is loaded in the nip;

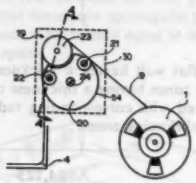
e. spring means responsive to the drive means for rotating the shaft in the opposite direction after the roller has been driven said predetermined amount; and

f. means for applying a torque, to prevent the shaft from reversing its direction, when the spring induced motion is limited by the abutment means.

3,944,122
DEVICE FOR GUIDING THE MAGNETIC TAPE IN MAGNETIC TAPE HANDLING APPARATUS

Emilio Pellicano, Milan, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Filed Jan. 2, 1974, Ser. No. 430,250
Claims priority, application Italy, Dec. 29, 1972, 33776/72
Int. Cl.² B65H 23/32
U.S. Cl. 226—198 8 Claims



1. In apparatus for handling an elongated tape, tape guiding means including the combination of a tape direction modifying roller and a guide unit, said roller being free of tape edge guidance means, said guide unit comprising a fixed arcuate guide surface positioned immediately adjacent said roller and including a pair of tape contacting surface portions straddling said roller along the path of said tape, said surface portions being adapted to provide guiding engagement with said tape through a limited wrapping angle and having a dimension in a direction transverse to said tape path slightly in excess of the width of said tape, and separate edge guiding shoulders spaced in said transverse direction to accept said arcuate guide surface therebetween for transversely aligning said tape immediately adjacent said roller.

3,944,123
SOLDERING FLUX

Norman L. Jacobs, 108 Addison House, Grove End Road, St. John's Wood London N.W.8, England

Filed Sept. 10, 1974, Ser. No. 504,485
Int. Cl.² B23K 31/02
U.S. Cl. 228—223 5 Claims

1. A method of soldering tin plate in which as the soldering flux is used a flux comprising at least one compound selected from the group consisting of dimerised and trimerised unsaturated aliphatic monocarboxylic acids having at least 10 carbon atoms.

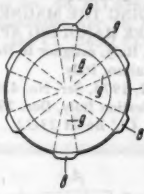
3,944,124
PLASTIC CONTAINERS

Gunter Hexel, Braunschweig, Germany, assignor to Schmalbach-Lubeca-werke AG, Braunschweig, Germany

Filed July 24, 1972, Ser. No. 274,401
Claims priority, application Germany, July 28, 1971, 7128947
Int. Cl.² B65D 25/00, 1/44
U.S. Cl. 229—1.5 B 1 Claim

1. A pot and adapted to contain a yoghourt product subject to refrigeration comprising a molded plastic cup shaped body having an integral bottom and a continuous conical wall terminating in an open edge, said wall being formed of a thin material having a plurality of integral circumfrentially spaced-apart strip-like reinforcing zones extending between the bottom and said edge and having at least in part a directional component intersecting said edge and the bottom edge, each of said reinforcing zones having lateral edges which smoothly taper in a continuous transition to the flat remaining areas of the wall

and having a width substantially smaller than that of the intervening flat walls whereby the define thin wall sections which are elastic and resistant to breakage and circumferentially spaced-apart reinforcing zones which provide container stiffness, said flat wall having a thickness of 0.3 mm and said reinforcing zones having a thickness of 0.7 mm, said bottom being formed with corresponding radial zones which merge with said reinforcing zones.



3,944,125

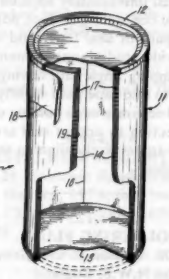
CONTAINER

Jack Friedman, 250 Kensington, Westmount, Quebec, Canada

Filed Oct. 9, 1974, Ser. No. 513,231

Int. Cl.² B65D *5/40, 25/14*

U.S. Cl. 229—3.1 **5 Claims**



1. A container for carrying oil, said container comprising,

a continuous encircling, open ended, side wall of paper,

a bottom end sealing disc secured to the bottom of said side wall,

a homogeneous single oil impervios resin layer derived from a sprayed polyvinylidene chloride aqueous emulsion applied to the inner face of said side wall and exposed joints between said side wall and said bottom end,

said impervious resin being partially impregnated into said side wall to a depth of at least 3 mils to anchor said resin layer which defines an oil receiving uninterrupted chamber within said side wall.

3,944,126

CONTAINER

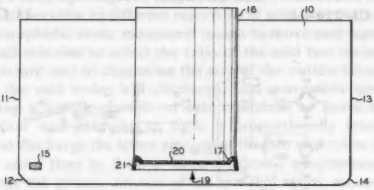
Frank P. Richards, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 2, 1974, Ser. No. 511,271

Int. Cl.² B65D *3/04, 3/14*

U.S. Cl. 229—4.5 **3 Claims**

1. A container having a cylindrical or a conically shaped side wall constructed from a generally rectangular blank which has one bottom corner cut off and the other bottom corner rounded, said blank being formed into a container side wall with one side edge of the blank overlapping the opposite side edge to form a side wall seam with the rounded corner on the inside, an end closure member comprising a generally cylindrical disc having a skirt depending therefrom which is crimped to the bottom of the blank to form a bottom seam, and means to prevent leakage at the joint which is formed at the junction of the side wall seam and the bottom seam comprising a bead of sealant positioned at said junction and adhering to the side wall and bottom closure, said bead of sealant being of such size as to fill the joint which formed at said junction.



3,944,127

DISPENSING CARTON HAVING A BAG-LIKE LINER

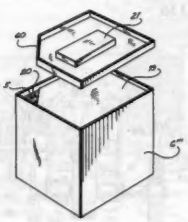
Richard Leroy Bruke, and Lars Göran Larsson, both of Malmo, Sweden, assignors to Aktiebolaget Platmanufaktur, Malmo, Sweden

Filed Sept. 11, 1974, Ser. No. 504,852

Claims priority, application Sweden, Sept. 18, 1973, 7312683; Sept. 18, 1973, 7312684

Int. Cl.² B65D *5/56, 25/16*

U.S. Cl. 229—14 B **9 Claims**



1. A storage and shipping carton comprising:

a container made of a form-retaining material and having an opening in one side;

a rim extending from the inner surface wall of the container adjacent to the side opening of the container;

a cover constituting part of the container and being movable into and out of a position covering said opening, said cover when in its covering position being in sealing engagement with said rim;

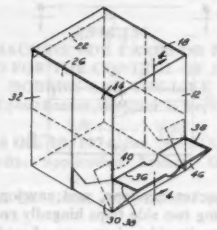
an inner liner for placing goods therein, said inner liner being made of pliable material and having a shape substantially matching the inner shape of the container, the inner liner including a surface portion substantially parallel to the side of the container including the opening and in registry with said opening; and

fastening means fastening the liner at said surface portion to an inner surface of the container along a line adjacent to said opening in the container.

3,944,128
SHIPPING AND DISPENSING CONTAINER

Thomas E. Hogan, Waterville, Ohio, assignor to International Automated Machines, Inc., Perrysburg, Ohio

Filed Jan. 6, 1975, Ser. No. 538,791
Int. Cl.² B65D 5/72
U.S. Cl. 229—17 B 7 Claims



1. A shipping and dispensing container formed of a one piece blank of generally rectangular shape and having front, rear, top and bottom walls and a pair of opposite end walls, said front, rear, top and bottom walls each consisting of a panel of single thickness hingedly connected together by fold lines at their adjacent edges, each end wall comprising four panels hingedly connected by a fold line, one with each of said top, bottom, front and rear walls, said front wall having a score line extending generally horizontally thereacross intermediate the upper and lower ends thereof, the end wall panels connected to the front wall each being severed along a line extending downwardly and rearwardly from the adjacent end of the score line on the front wall and then upwardly and rearwardly to the free edge of the last-mentioned panel, the portion of each of the last-mentioned panels below said severed line being folded inwardly perpendicular to the plane of the front wall and defining an inner surface portion of the container, the end wall panels connected to the bottom wall being folded upwardly to overlie said inwardly folded panel portions, the end wall panels connected to the top wall being folded downwardly to a plane perpendicular to the top wall and defining an inner surface portion of the container, the portion of each end wall panel connected to the front wall above said severed line being folded inwardly perpendicular to the plane of the front wall with the lower end portions thereof overlying said upwardly folded end panels and the upper portions thereof overlying said downwardly folded end panels, the end wall panels connected to the rear wall being folded forwardly to overlie the upwardly and downwardly folded end wall panels so that the container assumes the shape of a cube, means securing said walls together to retain said cubical shape, said front wall being adapted to be severed along said score line so that the portions thereof below said severed lines are substantially free so that they can be tilted outwardly to a position wherein the upwardly and rearwardly extending severed edges of said lower portions of said end panels engage the inner face of the front wall above said score line and thereby form a dispensing trough at the lower portion of said front wall.

3,944,129
CORRUGATED SHIPPING TRAY WITH AIR SPACE SURROUNDINGS

Richard J. McCall, Crystal Lake, Ill., and Marvin Wolfe, Port Washington, N.Y., assignors to Mack-Chicago Corporation, Chicago, Ill.

Filed Nov. 18, 1974, Ser. No. 524,877
Int. Cl.² B65D 5/26, 5/22
U.S. Cl. 229—32 6 Claims

1. A shipping tray comprising:

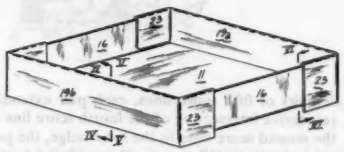
a rectangular panel having two end and two side edges and having a thickness;

two side panels each connected to a side edge of said rectangular panel by a side fold, each of said side panels further having a side panel depth perpendicular to said side fold and a length substantially equal to the length of said side edge of said rectangular panel;

two end panels each connected to an end edge of said rectangular panel by an end fold,

each end panel extending the full length of the end edge of said rectangular panel and a distance beyond each side edge and being separated from each of said side panels by a slot,

each end panel having a depth perpendicular to said end fold equal to the sum of twice the side panel depth, approximately four times said rectangular panel thickness, and a distance substantially equal to the thickness of a desired air space,



each end panel having two end panel fold lines each parallel to the end edges of the rectangular panel and extending the length of said end panel, the first end panel fold line being a distance from the rectangular panel end edge equal to the depth of a side panel plus approximately one panel thickness and the second end panel fold line being a distance from the first end panel fold line equal to approximately three thicknesses of the material of said rectangular panel, and

each end panel further having two flap fold lines each substantially colinear with the corresponding side edge and extending the depth of said end panel and forming end flaps at either end of each end panel;

whereby the panels may be folded in relation to one another to form a tray having a rectangular bottom and vertical sides and which is supported a distance above an underlying flat surface by said end panels to create an air space therebelow, and said end flaps capture full-length portions of the side panels between the folds thereof to maintain the tray in its folded condition.

3,944,130
CONTAINER AND BLANK

Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 3, 1974, Ser. No. 502,855
Int. Cl.² B65D 5/02
U.S. Cl. 229—37 R 6 Claims

1. A container blank comprising:

a sheet of paperboard or the like of rectangular configuration having upper and lower edges and first and second side edges;

a first score line extending from the first side edge to the second side edge in spaced relationship with and parallel to the upper and lower edges;

four second score lines, each extending from the upper edge to the lower edge and being parallel to the side edges, the second score lines being spaced from one another to form the edges of a container of rectangular cross section when the blank is formed into a container by bending at the second score lines;

four pairs of third score lines, each pair extending from a respective intersection of the first score line and one of

the second score lines to the upper edge, the pair forming an acute angle with one another with the respective second score line being located therebetween;

a fourth score line extending from the first side edge to the second side edge, said fourth score line being parallel to the first score line and being positioned between the first score line and the lower edge; and

four pairs of fifth score lines, each pair extending from a respective intersection of the fourth score line and one of the second score lines to the lower edge, the pair forming an acute angle with one another with the respective second score line being located therebetween.

3,944,131

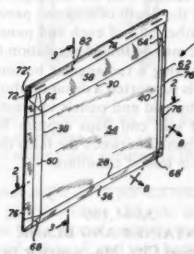
MULTI-SIZE MAILING CARTON

Adolph Weiss, 256 Georgia Ave., Brooklyn, N.Y. 11207

Filed July 18, 1974, Ser. No. 489,782

Int. Cl.² B65D *5/02*

U.S. Cl. 229—40 **8 Claims**



1. A blank of the type from which mailing cartons may be formed, said blank being of the type made of rigid paperboard and comprising:

a large and small rectangular panel hingedly secured to one another by a crease line; each panel having symmetrically disposed therein at equal distances from said joining crease a first, second, and third parallel crease lines; said larger panel having a fourth crease line at a distance from said joining crease line equal to a parallel terminal edge of said shorter panel; a plurality of crease lines perpendicular to said hinge crease line; said perpendicular and parallel crease lines extending the entire width and length, respectively, of said blank and defining therein at least two rectangular panels framed by smaller overlapping rectangular panels; diagonal crease lines symmetrically disposed about said blank bisecting said overlapping portions of said smaller rectangular panels.

3,944,132

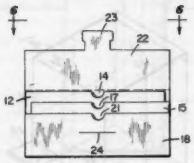
MULTI-POCKETED ENVELOPE

Robert C. Caprile, and Marilyn E. Caprile, both of 197 N. Morton, Hoffman Estates, Ill. 60172

Filed Sept. 16, 1974, Ser. No. 506,221

Int. Cl.² B65D *27/08*

U.S. Cl. 229—72 **2 Claims**



1. A three pocket envelope, said envelope comprising a back panel having two side flaps hingedly connected to said back panel along its side edges, one of said flaps having a height greater than the height of the other said side flap, a bottom flap hingedly connected to said back panel along its bottom edge, said flap having a height less than the height of the shorter of said side flaps, and a top flap, hingedly connected to said back panel along its top edge said side flaps extending substantially across the back panel and terminating within close proximity of the side edges of the back panel and forming two separate and distinct pockets with one of said side flaps being taller than the other side flap to form openings to the pockets one above the other, said one of said side flaps directly overlying said back panel, said bottom flap extending upward from the bottom edge of said back panel to form a bottom pocket that is separate and distinct from the pocket formed by the side flaps, said bottom pocket opening below the openings of the pockets formed by the side flaps, said bottom flap being adhesively secured at its side portions to the side flaps said top flap being capable of folding over the pockets to enclose them and secure them shut.

3,944,133

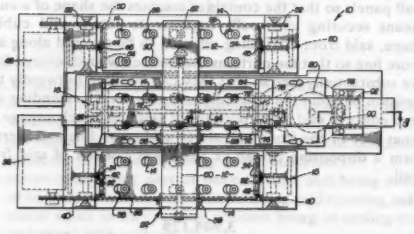
AUTOMATED CENTRIFUGE

Archie Kessell, Huntington Beach, Calif.; Edward J. Kottsieper, Dresden, Maine; Charles S. Phelan, Tustin, and Ralph Ranalli, Anaheim, both of Calif., assignors to Rohe Scientific Corporation, Santa Ana, Calif.

Filed Dec. 26, 1972, Ser. No. 318,416

Int. Cl. B04b *9/12*

U.S. Cl. 233—26 **5 Claims**



1. In a centrifuge for sample containers, the combination of:

a. spinning means for simultaneously spinning all of the containers in a group thereof about their respective axes with such axes vertical;

b. an inlet elevator on one side of said spinning means for conveying the group of containers vertically to the level of said spinning means with the axes of the containers vertical;

c. an outlet elevator on the opposite side of said spinning means for conveying the group of containers from the level of said spinning means with the axes of the containers vertical;

d. means for transferring the group of containers horizontally from said inlet elevator to said spinning means and from said spinning means to said outlet elevator; and

e. means for actuating said spinning means.

3,944,134

PUNCHING MACHINE FOR CARDS OR PAPER BANDS TO BE USED FOR THE CONTROL OF JACQUARDS, DOBBIES AND THE LIKE

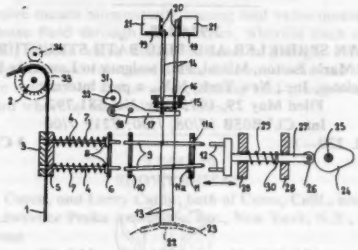
Pierre Frappe, Lyon, France, assignor to Verdol S.A., Caluire, France

Filed Oct. 10, 1974, Ser. No. 513,892

Claims priority, application France, Oct. 29, 1973, 73.39274

Int. Cl.² G06K *1/08*; D03C *17/00*

U.S. Cl. 234—111 **5 Claims**



1. A punching machine for cards and paper bands used for the control of Jacquards, dobbies and the like, comprising:

a. multiple punches arranged to punch the cards and bands;

b. actuator means disposed to actuate said punches;

c. selector rod means connected to control the actuator means, each rod means having a portion made of magnetically attractable material and each rod means being movable between an inoperative position and an operative position in which it positions an actuator means to actuate a corresponding punch;

d. reciprocable means coupled to said rod means and operative to move them between said operative and inoperative positions; and

e. retaining means corresponding with each selector rod means and selectively operable to retain the corresponding rod means in one of said positions, each retaining means comprising an electromagnet having magnetic pole means disposed adjacent to the path of the magnetically attractable portion of a corresponding selector rod means to act directly upon the rod means when the rod means is in one of said positions, the pole means being disposed such that when the electromagnet is energized said portion of the rod means will be retained by the pole means and prevented from movement to the other position of the rod means.

3,944,135

CONDITION RESPONSIVE VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

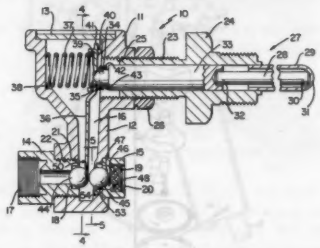
Fred Kalinovski, King of Prussia, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed July 12, 1974, Ser. No. 487,908

Int. Cl.² G05D *23/02*

U.S. Cl. 236—102 **26 Claims**

1. A condition responsive valve construction comprising a housing means having a valve seat, a pair of balls having their respective substantially spherical surfaces secured together in abutting relation and being movable toward and away from said valve seat so that one of said balls acts to open and close said valve seat, a lever movably mounted in said housing means and acting between said balls to cause movement thereof, and condition responsive means carried by said housing means and being operatively associated with said lever to cause movement thereof upon conditions sensed thereby.



16. A method of making a valve construction as set forth in claim 15 and including the step of forming said part of said lever at one end thereof with a slot passing therethrough that straddles said secured together balls.

3,944,136

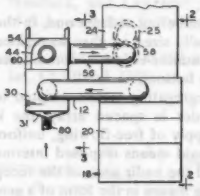
SMALL BUILDING HEATING SYSTEM

Edwin C. Huie, 6343 SE. Thorburn Ave., Portland, Oreg. 97215

Filed Feb. 3, 1975, Ser. No. 546,340

Int. Cl.² F24B *7/02*

U.S. Cl. 237—55 **9 Claims**



1. In a heating system for

a small building,

a chimney,

furnace means in the building including a burner means, combustion air supply means and flue gas exit means,

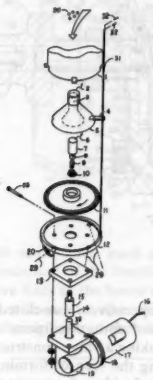
stack means connecting the flue gas exit means to the chimney,

conduit means completely separate from the combustion air supply means and having an inlet outside the building and an outlet connected to the stack means for supplying outside air to the stack means to cool the flue gas and to act as a damper to control the flow of the flue gas to the chimney, and an auxiliary heat exchange means in the stack means upstream from the outlet of the conduit means and receiving heat from the flue gas.

3,944,137
AERIAL SEEDER AND METHOD

Malcolm A. Cutchins; Winfred A. Foster, Jr., both of Auburn, Ala.; Peter A. Orlin, Reseda, Calif.; Fred W. Martin, and John E. Burkhalter, both of Auburn, Ala., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 18, 1975, Ser. No. 550,795
Int. Cl.² A01C *17/00*
U.S. Cl. 239—11 **3 Claims**



1. A device operable from a controlled, ground-level superior, moving and dirigible platform to segregate the particles of a free-flowing, uniform particulate solid material and to disperse the segregated particles over a land area in accordance with a preselected pattern, which device consists of the following integrated components each defined as a means and characterized by a related function:

a. means defining a receptacle with bottom and side walls adapted to contain and deliver a continuing supply of free-flowing, uniform, particulate solid material to the receptacle bottom via gravity induced downward displacement;

b. means, numbering at least one, in the form of openings dimensionally sized to pass segregated particles serially, defining interior-exterior communication through the receptacle bottom;

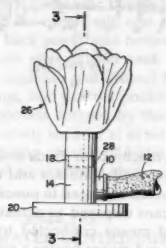
c. particle segregating means adapted to individualize and serially order in spaced array, the individual particles from a supply of free-flowing, uniform particulate solid material, said means disposed intermediate the material supply and the nadir area of the receptacle bottom, said segregating means in the form of a generally planar member extended in length and width dimensions to conform with at least the nadir area of the receptacle bottom, movement clearance there-between provided, said member provided with an associated driving mechanism controllable to impart to said member uniform periodic movement in a plane normal to the nadir area of the receptacle bottom, said member perforated over the length and width extended area with a multiplicity of spaced, uniform openings directed through the thickness dimension of the member and collectively disposed to define at least one functionally endless, serially ordered array of openings, each opening adapted dimensionally to accommodate, effectively isolate, and transport individual segregated particles from the material supply, the openings severally disposed to insure that periodic movement of the extended member will carry each opening, serially relative its immediate array adjacent openings, into register with a receptacle bottom opening, once per cycle of periodic movement;

d. particle projecting means, numerically equal to the receptacle bottom openings of (b) supra, each projecting means comprising a particle ingress aperture communicatively adjacent an associated receptacle bottom opening, a particle accelerating section actuated via an externally supplied pressurized fluid, and a particle egress aperture, each projecting means selectively adjustable relative the directional orientation in space of its particle egress aperture and each particle projecting means functionally adapted to serially accept, serially accelerate, and serially project segregated and ordered individual particles away from its egress aperture at controlled interval rate and at controlled speed, thereby to generate in space a trajectory defined by an ordered array of moving, spaced particles, the plurality of particle projecting means, severally aimed pursuant to a planned collective trajectory orientation, continuously translocated via movement of the platform effecting distribution of individualized particles in accordance with a predetermined ground pattern.

3,944,138
LAWN SPRINKLER AND BIRD BATH STRUCTURE

Maysel Marie Easton, Miami, Fla., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed May 29, 1975, Ser. No. 581,792
Int. Cl.² B05B *17/08*, *1/00*; F21P *7/00*
U.S. Cl. 239—18 **3 Claims**



1. A water sprinkler which comprises: a first hose fitting, a housing having an interior chamber in fluid communication with said first hose fitting, said housing having a second fitting carried on said housing and disposed in fluid communication with said chamber, said housing further including a base for support thereof, a sprinkler head having a third fitting dimensioned and configured for selective engagement with said second fitting, said sprinkler including a plurality of three dimensional representations of flowers including petals, said petals having a plurality of passageways disposed therein communicating with said third fitting.

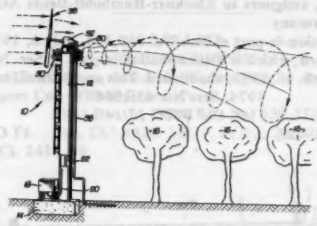
3,944,139
MOISTURIZING APPARATUS FOR USE WITH WIND MACHINES

Donald E. Butler, Glendale, Calif., assignor to SSP Agricultural Equipment, Inc., Burbank, Calif.

Filed Mar. 6, 1975, Ser. No. 555,857
Int. Cl.² A01N *17/08*
U.S. Cl. 239—77 **9 Claims**

1. The combination of a wind machine and air moisturizing means adapted for use on agricultural crops, said combination including a hollow vertical tower mounted on the ground; a rotatable fan mounted at the top of said tower for creating an air stream horizontally over the crops; power means coupled to said fan; gearing means on said tower and coupled with said power means for rotating said fan 360° around the vertical axis of said tower; a fluid manifold on said tower; fluid supply

means connected to said manifold; fluid nozzles on said manifold and in communication therewith to direct fluid upward into said air stream; said nozzles including normally closed valve means spaced between said manifold and said nozzle to control fluid flow from said manifold through said nozzles; camming means linked with said fan and rotatably engaging



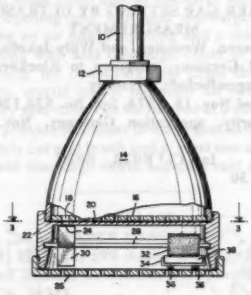
said valve means momentarily biasing said valve means open to release fluid through said nozzles; wherein each of said normally closed valve means includes a plunger extending radially from said valve and a cam follower at the end thereof remote said valve, and a spring biasing said plunger radially outward whereby said valve is closed.

3,944,140

SHOWER HEAD

Joe L. Caton, and Larry Caton, both of Ceres, Calif., assignors to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Mar. 24, 1975, Ser. No. 561,054
Int. Cl.² B05B *7/28*
U.S. Cl. 239—315 **3 Claims**



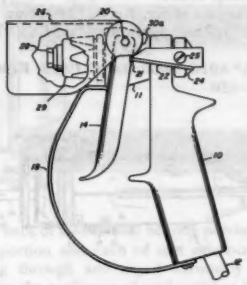
1. Means for mixing and dispensing comprising a shower head for mixing and dispensing a detergent with water, said shower head having a housing defining a flow path intermediate influent means adapted to receive a source of water under pressure and effluent means, shaft means rotatingly mounted in said housing and transverse to said flow path, said shaft having impeller blade means mounted thereon and in said flowpath so that said blade means rotate said shaft when water under pressure impinges on said blade means, rotary brush means mounted on said shaft for rotatingly engaging a detergent bar, tray means arranged for presenting a detergent bar for engagement with said brush means, resilient means arranged to allow continuous engagement of a detergent bar with said brush means while such detergent bar is being consumed during use.

3,944,141

SPRAY GUN SHIELD AND TRIGGER SAFETY APPARATUS

Bernard Siczek, La Grange Park, Ill., assignor to Graco Inc., Minneapolis, Minn.

Filed May 19, 1975, Ser. No. 578,543
Int. Cl.² B05B *15/04*, *11/00*
U.S. Cl. 239—288.5 **9 Claims**



1. A safety spray gun apparatus for accepting hydraulically pressurized fluid and for emitting an atomized fluid spray through an orifice under control of an actuating trigger, which opens an internal valve to permit fluid flow, comprising:

a. a valve rod connected to said internal valve and sealably projecting external said spray gun;

b. an actuating arm pivotally attached to the projecting end of said valve rod and contacting said actuating trigger; and

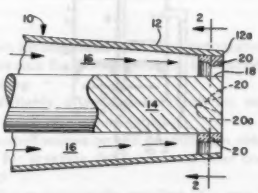
c. a spray orifice shield pivotally mounted on spray gun, the region about said mounting point being constructed in an eccentric cam surface contacting said actuating arm, said shield having a forwardly projecting hood for at least partially blocking the region forward of the spray orifice, whereby the shield may be lifted about its mounting point and said cam surface will engage said actuating arm to move it from contact with said actuating trigger.

3,944,142

SPLIT STREAM BURNER ASSEMBLY

Robert P. Welden, Westfield, and Lawrence V. O'Connor, Morristown, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Mar. 22, 1974, Ser. No. 453,754
Int. Cl.² B05B *1/06*
U.S. Cl. 239—552 **3 Claims**



1. A burner assembly comprising a housing adapted to receive a fuel, a rod extending within said housing for defining an annular flow path for said fuel through said housing, said flow path terminating in an annular discharge opening, and a plurality of posts extending between said housing and said rod and spaced around said annular discharge opening for splitting up the fuel discharging from said opening so that, upon ignition of said fuel, a plurality of flame patterns are formed, each

of said posts having a triangular cross-section with a base of said triangle extending substantially flush with the discharge end of said housing and with an angle of said triangle extending in said flow path upstream from said base.

3,944,143

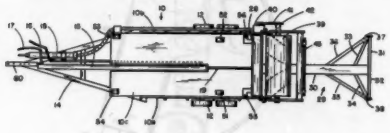
POWER TRAINS AND POWER TRAIN CONTROLS

Daniel W. O'Reilly, and Joseph D. O'Reilly, both of Rte. No. 3, Goodhue, Minn. 55027

Continuation-in-part of Ser. No. 412,690, Nov. 5, 1973, Pat. No. 3,887,153. This application Mar. 17, 1975, Ser. No. 559,134

Int. Cl.² A01C *19/00*; E01C *19/20*; F16C *1/02*

U.S. Cl. 239—650 9 Claims



1. A flexible drive mechanism operable for powering a device by transmitting torque around a bend comprising:

an input member for ataching a first source of power;

a housing for rotatably supporting a flexible cable;

a flexible cable mounted in said housing, said flexible cable operable for flexing at least once per revolution and transmitting a torque during the flexing; said cable comprised of strands which simultaneously flex and tighten around one another during the transmission of torque to thereby produce a displacement of said cable in said housing in response to the torque applied thereto.

3,944,144

METHOD AND APPARATUS FOR DISPERSING SUSPENSIONS

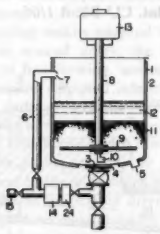
Akira Okada, Fujiidera; Ryoji Izumi, Neyagawa; Syogo Ninomiya, Itami; Yukio Tahara, Toyonaka; Yuji Takehara, Nishinomiya; Masaaki Suezawa, Matsubara, and Kazuhiro Kawasaki, Ibaraki, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Filed June 10, 1974, Ser. No. 478,167

Claims priority, application Japan, June 13, 1973, 48-66520

Int. Cl.² B02C *17/16*

U.S. Cl. 241—22 10 Claims



1. A method for dispersing suspensions which comprises charging grinding media and a suspension containing solid particles in a vessel so that the grinding media/suspension volume ratio is withing the range of from 2/1 to ½, and agitating the suspension and grinding media by rotating a single agitation rod mounted on the tip end of an agitation shaft at a lower part of the central portion of the vessel so that the peripheral velocity of the tip of the agitation rod is within a range of 6 to 20 m/sec, and a laminar flow is produced in the suspension to thereby disperse the suspension in the colloidal state.

3,944,145

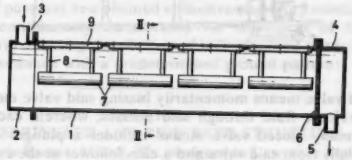
GRINDING MILL WITH EXCITATION MEMBER IN THE CHARGE OF MATERIAL TO BE COMMINUTED

Günter Eichholz, Cologne, and Peter Wehren, Krefeld, both of Germany, assignors to Klockner-Humboldt-Deutz AG, Cologne, Germany

Continuation-in-part of Ser. No. 269,320, July 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 115,386, Feb. 16, 1971, abandoned. This application Jan. 22, 1974, Ser. No. 435,584

Int. Cl.² B02C *17/14*

U.S. Cl. 241—23 17 Claims



1. Grinding mill having at least one container partially filled with grinding media, and a plurality of excitation members extending spaced from one another in direction of the longitudinal axis of said container and disposed within said container so as to be surrounded by the grinding media received in said container, said excitation member being supported on the wall of said container by a plurality of separate rod-shaped support elements extending substantially radially from said excitation member and disposed in spaced relationship to one another in direction of said longitudinal axis.

3,944,146

CRUSHER GAP SETTING BY ULTRASONIC MEASUREMENT

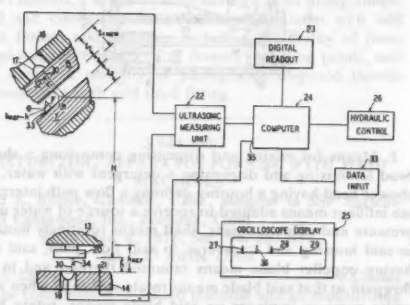
Helmut Stockmann, Wesseling, and Willy Jakobs, Porz-Grengel, both of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Nov. 15, 1974, Ser. No. 524,126

Claims priority, application Germany, Nov. 17, 1973, 2357432

Int. Cl.² B02B ; B02C

U.S. Cl. 241—30 19 Claims



1. A method for the determination and adjustment of a width of a crusher gap and rate of wear of a crusher member of a gyratory crusher, particularly a gyratory crusher with hydraulic adjustment of an adjusting cone, comprising the steps of:

a. a thickness of a stationary crusher sleeve and an adjustment as to height of a crusher cone in reference to a housing are measured in each case by ultrasonic means according to an impulse-echo method and

b. a width of a crusher gap is determined by means for comparison and display measuring signals generated by said ultrasonic means.

3,944,147

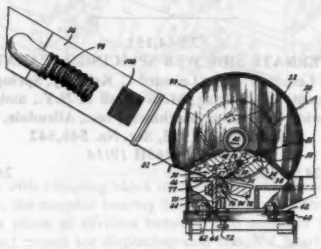
BRUSH CHIPPER

Robert E. Pletcher, Azusa, Calif., assignor to Asplundh Tree Expert Co., Willow Grove, Pa.

Filed Dec. 6, 1974, Ser. No. 530,272

Int. Cl.² B02C *18/14, 21/02, 23/20*

U.S. Cl. 241—60 **10 Claims**



1. A brush chipper comprising a housing having an inlet opening and an outlet opening communicating with a discharge chute; a cutter bar rigidly carried in said housing and a rotor rotatably mounted adjacent said cutter bar, said rotor including a plurality of cutting blades extending outwardly beyond the periphery thereof, said cutting blades being operable with said cutter bar for cutting brush fed through said inlet opening into small chips and to discharge said chips through said outlet opening and into said discharge chute, blower means having an air intake opening and a discharge opening communicating with said discharge chute at a point spaced from said rotor for conveying said chips through said discharge chute, inertia means mounted for rotation with said rotor whereby said rotor can be rotated at a slower speed than normal and provide sufficient force so that said cutting blades can adequately cut said brush and at least one air inlet opening formed in said discharge chute adjacent said rotor.

3,944,148

PAPER CASSETTE

Lawrence M. Freeman, 599 Ansley Court, NE., Atlanta, Ga. 30324, and Francis T. Arnold, 2379 Tristan Circle, NE., Atlanta, Ga. 30345

Division of Ser. No. 304,519, Nov. 7, 1972, which is a continuation-in-part of Ser. No. 146,114, May 24, 1971, Pat. No. 3,730,622. This application June 17, 1974, Ser. No. 479,997

Int. Cl.² B65D *85/67;* **B65H** *75/30*

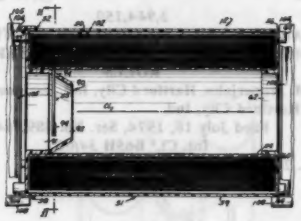
U.S. Cl. 242—55.53 **7 Claims**

1. A cassette for holding a roll of flexible material comprising:

a tubular member having the roll of material wound thereabout;

a housing defining a chamber therein and including mounting means for rotatably mounting said tubular member with said roll of material thereon within said chamber, said housing further defining an opening therethrough for discharge of a layer of material from said roll of material therethrough; said mounting means including an annular flange adapted to fit within said tubular member for rotatably supporting same, said annular flange defining a plurality of cutouts therethrough positioned within said tubular member; and,

braking means including a resilient member comprising an arcuate central bearing portion having opposite ends and a pair of side bearing portions resiliently connected to the



opposite ends of said central bearing portion, said central bearing portion and each of said side bearing portions extending through and urged outwardly through said cutouts by the resiliency of said member to engage said tubular member for exerting forces on said tubular member resisting rotation of said tubular member.

3,944,149

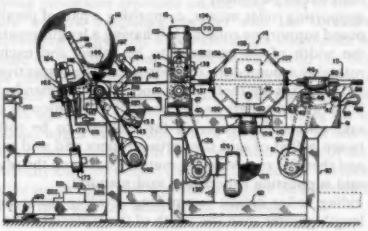
TUCKING DEVICE FOR BATCHING AND DOFFING A FABRIC WEB

Robert Frezza, Carle Place, N.Y., assignor to Samcoe Holding Corporation, Woodside, N.Y.

Continuation-in-part of Ser. No. 348,068, April 5, 1973, Pat. No. 3,875,624. This application Aug. 5, 1974, Ser. No. 494,516

Int. Cl.² B65H *19/20*

U.S. Cl. 242—56 R **7 Claims**



1. A tuck-in arrangement for a semi-automatic batching and doffing apparatus for winding fabric in batches, and of the type comprising

a. a controllably driven winding roll for supporting and driving a roll of winding fabric,

b. fabric cutoff means on the downstream side of the winding roll for severing the fabric web after completion of a roll, and

c. means for restarting the winding of a new roll including means for directing the cutoff end of the fabric web back and over a newly positioned winding mandrel; the improvement characterized by

d. said restarting means including a controllably movable tuck-in support extending across the width of the machine upstream of the new mandrel and the winding roll,

e. a pair of spaced apart pivoted arms supporting said tuck-in support at each end thereof,

f. each of said arms supporting a pair of pressure bearing rollers,

g. a plurality of spaced apart movable brackets affixed to said tuck-in support, and

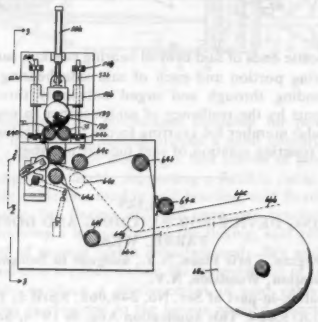
h. a flexible elongated tuck-in element affixed to each of said brackets for engaging a loop of the fabric end and tucking it into the bight formed between the mandrel and winding roll.

3,944,150

APPARATUS AND A METHOD FOR SLITTING AND WINDING ELONGATED SHEETS OF MATERIAL INTO ROLLS

Brian M. Jennerjahn, Hartford City, Ind., assignor to Phylpat, Inc., Hartford City, Ind.

Filed July 18, 1974, Ser. No. 489,764
Int. Cl.² B65H *34/02*
U.S. Cl. 242—56.2 **31 Claims**



1. An apparatus for winding elongated sheets of material into rolls, which comprises:

a. a mandrel having a length greater than the width of the material to be rolled;

b. supporting roller means, comprising a pair of parallel-disposed supporting rollers each having a length greater than the width of the material to be rolled and each being rotatably mounted for rotation about the respective longitudinal axes thereof, for supporting said mandrel upon both of said rollers and in parallel disposition to both of said rollers, for receiving the material to be rolled between a first of said supporting rollers and said mandrel, and then for receiving the material between the second of said supporting rollers and said mandrel;

c. riding roller means comprising a riding roller having a length greater than the width of the material to be rolled, being rotatably and reciprocably mounted at opposite ends thereof for rotation about the axis thereof, for guiding said riding roller to a first position wherein said riding roller is in longitudinal surface contact with said mandrel distal from said supporting rollers when said mandrel is in longitudinal surface contact with said supporting rollers, for guiding and riding roller distally from said supporting rollers and said mandrel to a plurality of positions wherein the axis of said riding roller is substantially parallel to the axes of said supporting rollers and wherein the axis of said riding roller is disposed aroung the axis of said mandrel by an angle less than 180 degrees from the longitudinal axis of either of said supporting rollers, and for receiving the material to be rolled between said riding roller and said mandrel after said material passes between said second supporting roller and said mandrel;

d. drive means being operably connected to said first supporting roller for imparting a predetermined rotational speed thereto for receiving the material to be rolled between said first supporting roller and said mandrel and then for transporting the material toward said second supporting roller, and being connected to one of the other of said rollers for applying a force to said other roller to rotate said other roller at a rotational speed a predetermined amount higher than the rotational speed of said first roller and including means for limiting the force applied to said other roller to a predetermined maximum so that said paper is protected against excessive tensional forces on said sheet material between said rollers;

e. rider roll forcing means being operatively connected to said riding roller means, for resiliently forcing of both ends of said riding roller in a plane substantially orthogonal to the plane through the axes of said supporting rollers, and for controlling the forcing of said riding roller toward and away from said mandrel and said supporting rollers; and

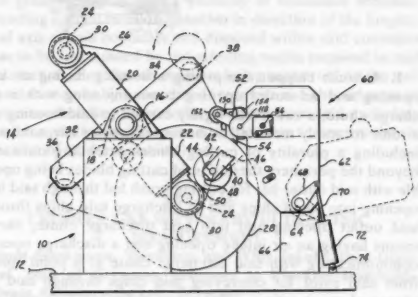
f. guide means for retaining said mandrel between said supporting rollers and said riding roller and for allowing said mandrel to move from said supporting rollers as material is rolled onto said mandrel.

3,944,151

ALTERNATE SIDE WEB SPLICING APPARATUS

Frank X. Lee, New York; Leonard C. Krimsky, Spring Valley, and Donald R. Freytag, Monroe, all of N.Y., assignors to Worldwide Converting Machinery, Inc., Allendale, N.J.

Filed Feb. 3, 1975, Ser. No. 546,542
Int. Cl.² B65H *19/14*
U.S. Cl. 242—58.3 **24 Claims**



1. Automatic web splicing apparatus for splicing the outer surface of a new roll web alternatively to the under surface of an expiring roll web or to the upper surface of an expiring roll web including in combination, a face of an expiring roll web including in combination, a support, a bumper roll, means mounting said bumper roll on said support for movement between a ready position and first and second fired positions, a knife roll, a knife on said knife roll, means mounting said knife roll on said support for movement between first and second ready positions and for movement from said first and second ready positions to respective first and second fired positions, and means for selectively initially positioning said knife roll in one of said ready positions.

3,944,152

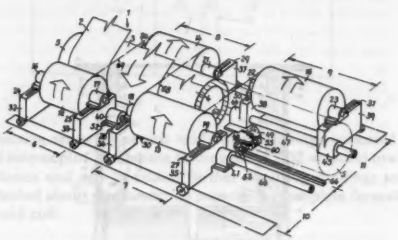
REWINDING MACHINE FOR LONGITUDINALLY SLIT WEBS OF PAPER

Willi Heymanns, Hemmerden ub. Neuss, Germany, assignor to Jagenberg-Werke AG, Dusseldorf, Germany

Filed Dec. 10, 1974, Ser. No. 531,412
Claims priority, application Germany, Dec. 28, 1973, 2364974
Int. Cl.² B65H *17/08*
U.S. Cl. 242—65 **4 Claims**

1. In a rewinding machine for continuous individual webs of paper or the like longitudinally cut from a wider web, including a backing cylinder, a plurality of winding shafts alternately

arranged diametrically opposite one another relative to said backing cylinder, a plurality of rolls respectively on said winding shafts, and bearing blocks for each of said rolls, whereby said individual webs contact said backing cylinder and alternate individual webs are taken up on the rolls arranged on the winding shafts on each side of the backing cylinder, the bearing blocks permitting said shafts and rolls to move away from said backing cylinder as the roll diameters increase due to webs wound thereon, the improvement which comprises means coupling a bearing block on one side of said backing



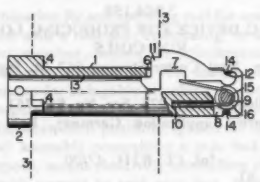
cylinder with a bearing block on the other side of said backing cylinder, the coupled bearing blocks constituting those which define a plane of division between two adjacent individual webs, and means for displacing said coupled bearing blocks along the axis of said backing cylinder, whereby in adjusting the rewinding machine to accept individual webs of different widths by displacement of the bearing blocks on both sides of the backing cylinder the coupling of the bearing blocks will ensure that opposite blocks are properly aligned to define planes of division.

3,944,153

SPINDLE AND LATCH

Elliott C. Linker, Irvine, Calif., assignor to Electronic Engineering Co. of California, Santa Ana, Calif.

Filed Mar. 19, 1975, Ser. No. 560,004
Int. Cl.² B65H *17/02*
U.S. Cl. 242—68.3 **9 Claims**



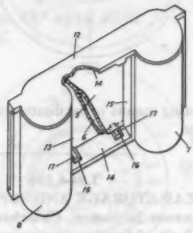
1. A spindle for removably retaining a reel, comprising;
a. a cylindrical spindle (1 or 21) having plural radial keys (4) at a common longitudinal position to drive said reel (3),
and a longitudinal slot oppositely longitudinally disposed with respect to said keys,
b. an end-pivoted latch (7 or 27) fitted within said slot (6), and
c. a spring (9 or 29) engaging said latch and bearing upon said spindle
to urge said latch radially outward to a limit set by the shape of the latch
to axially and circumferentially retain said reel upon said spindle.

3,944,154

FILM CASSETTE

Werner Hahn; Heinz Schulze, both of Dresden, and Bernhard Walther, Dessau, all of Germany, assignors to Veb Pentacon Dresden, Dresden, Germany

Filed Dec. 24, 1974, Ser. No. 536,234
Int. Cl.² G03B *1/04*
U.S. Cl. 242—71.2 **4 Claims**



1. A film cassette for photographic cassette cameras having a film trap and a housing with a film presser thereon said cassette comprising:
a. a supply chamber,
b. a take-up chamber,
c. a web connecting the two chambers, said web having a front and
d. a rear wall,
e. a film presser surface on said rear wall,
f. an exposure window defined by side and transverse walls extending from the front wall of said web into which window the film trap on the camera can be introduced,
g. fitting elevations provided on the side walls of the exposure window extending parallel with the direction of conveying of the film, which elevations commence in the plane of the film presser surface and extend out beyond the plane which the front of the film occupies when in the pressed position against the film presser surface and
h. guide surfaces on said fitting elevations facing the longitudinal edges of the film, which surfaces lie in one common plane together with the longitudinal edges of the film whereby on insertion of the cassette into the camera, the guide surfaces on said elevations engage both the surfaces of the film and the sides of the film trap.

3,944,155

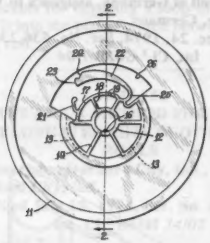
RIBBON SPOOL

Robert Hugh Wilczewski, Riverton, Wyo., and Rudolf Karl Schaefer, Des Plaines, Ill., assignors to Victor Comptometer Corporation, Chicago, Ill.

Filed Apr. 22, 1974, Ser. No. 462,969
Int. Cl.² B65H *75/28*
U.S. Cl. 242—74 **3 Claims**

1. A one piece plastic spool for an inking ribbon, comprising a pair of parallel side guide flanges, a central cylindrical hub, a segmental cylindrical wall spaced outwardly from said hub interconnecting said side flanges and having a ribbon-receiving peripheral surface, and ribbon anchoring means including a male latch having one end forming a reentrantly curved flexible hinge integral with said wall and a free end, and a female latch forming a hook for receiving said free end of said male latch to anchor an end of said ribbon therebetween, wherein said latches when in ribbon-anchoring position have their outer surfaces disposed as extensions of said peripheral surface of said segmental cylindrical wall, said male latch is

narrower than the space between said side flanges and each of said side flanges is provided with an aperture opposite said



ribbon anchoring means to facilitate attachment and removal of said ribbon.

3,944,156

THREAD STORAGE AND SUPPLY DEVICE

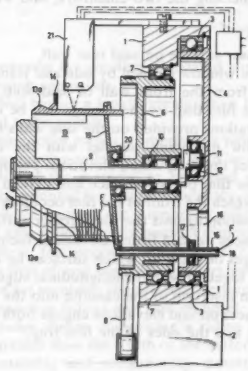
Kurt Arne Gunnar Jacobsson, Ulricehamn, and Ove Laursen, Blidsberg, both of Sweden, assignors to Aktiebolaget IRO, Ulricehamn, Sweden

Filed Aug. 26, 1974, Ser. No. 500,459

Claims priority, application Germany, Aug. 31, 1973, 2343994

Int. Cl.² B65H *51/20*

U.S. Cl. 242—47.12 5 Claims



1. A thread storage and supply device for a textile machine, comprising an axle having means associated with one end thereof for maintaining the axle in a nonrotatable condition, the axle having a free end portion adjacent the other end thereof, a thread storage drum nonrotatably mounted relative to said axle and disposed in surrounding relationship to the free end portion thereof, supply means for permitting a thread to be wound onto said drum, said supply means including a thread supply member disposed adjacent one end of said drum and rotatably journaled on said axle for rotation about the axis thereof, rotatable disc means disposed adjacent said supply member on the side thereof remote from said drum, said disc means being rotatable about an axis which is parallel to but radially displaced from the axis of said axle, and means drivingly interconnecting the disc means and the supply member for synchronous rotation, the improvement wherein said interconnecting means includes a thread guide pin mounted on the thread supply member and passing through a radial slot formed in said disc means so that the thread guide pin passes axially through both the supply member and the disc means, the thread guide pin having a channel extending axially therethrough for permitting passage of a thread which is to be wound on the drum.

3,944,157

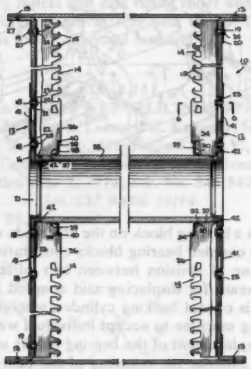
FABRIC REEL END FRAME

Theodore P. Kessler, Rancocas, N.J., assignor to Timron, Inc., Moorestown, N.J.

Filed Apr. 18, 1973, Ser. No. 352,184

Int. Cl.² B65D *85/671;* B65H *75/25*

U.S. Cl. 242—77.1 16 Claims



1. An end frame for a fabric reel comprising

a plate;

a plurality of hook-containing sections for impaling a fabric material thereon secured to said plate at predetermined points, said sections being in contact with said plate at said points and extending outwardly from said plate in a radiating pattern;

a board disposed between said plate and said sections; and

means for securing each said section at an outer end thereof to said board.

3,944,158

COLLECTING DEVICE FOR PRODUCING LONG WIRE ROD COILS

Franz J. Blinn, Karl Custer-Strasse, 667 St. Ingbert, Saar, Germany

Filed Feb. 5, 1975, Ser. No. 547,751

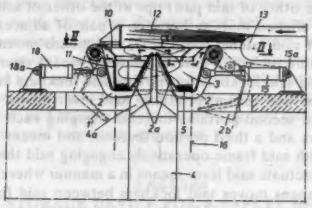
Claims priority, application Germany, Feb. 23, 1974, 2408850

Int. Cl.² B21C *47/00*

U.S. Cl. 242—81 6 Claims

1. In apparatus for forming a long wire rod coil from wire rod supplied in the form of overlapping non-concentrically disposed wire rod windings and utilizing a vertically displaceable centering mandrel having an upper end tapering to a point, a collecting device comprising wall means laterally defining a collecting space, means for supplying said wire rod windings into said collecting space, mutually oppositely disposed interceptor arm means pivotal into said collecting space for intercepting and temporarily supporting initial ones of said wire rod windings supplied to said collecting space, and mutually oppositely disposed pivotal arm means, each of said pivotal arm means being provided with a part-conical member, said pivotal arm means being pivotal toward said collecting space into a position wherein the part conical members of said pivotal arm means form a centrally disposed composite cone

means adapted to accommodate therein said upper end of said centering mandrel and having a composite conical surface for centering said initial wire rod windings and guiding them onto said interceptor arm means, and means for pivoting said pivotal arm means and said interceptor arm means out of said



collecting space to permit said initial windings collected on said interceptor arm means to drop along said mandrel toward its lower end and to enable further wire rod windings to be collected about said centering mandrel to complete formation of said coil.

3,944,159

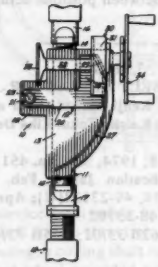
COMBINATION FLY AND SPINNING REEL

Donald G. Dobbs, 4011 NW. 189 Terrace, Miami, Fla. 33055

Filed Aug. 23, 1974, Ser. No. 499,828

Int. Cl.² A01K *89/00*

U.S. Cl. 242—84.2 B **1 Claim**



1. A combination fly and spinning reel for use with a fishing rod equipped with a reel seat comprising, in combination, a base support member, means for attachment of said base support member to a fishing rod reel seat, a substantially flat pivot arm, means for swingably attaching one end of said pivot arm with respect to said base support member for selective movement between limit positions spaced 90 circular ° apart, a fishing reel assembly comprising a gear box and an open-ended reel spool, means rotatively journalling one end of said reel spool with respect to said gear box, handle means for rotatively controlling said reel spool through said gear box, means mounting said fishing reel assembly comprising said gear box and said reel spool with respect to the other end of said pivot arm so that the rotational axis of said reel spool, when said pivot arm is in one of said limit positions, is disposed in transverse position with respect to a fishing rod when said base support member is attached to the fishing rod reel seat, and in axial alignment directly above and with respect to said fishing rod when moved to the other of said limit positions, said base support member and said pivot arm being substantially flat and relatively movable while in substantially face-to-face relation, said means for swingably attaching said pivot arm comprising a pivot member extending through aligned openings in said one end of said pivot arm and in said base support member, and an arcuate slot in said base support member the center of curvature of which is coincident with the pivotal axis of said pivot member, said pivot arm having hook means extending through said arcuate slot and serving as abutment means at the ends of said slot at said limit positions.

3,944,160

CASTING REEL SPOOL SPEED CONTROL DEVICE

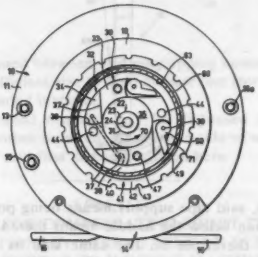
Douglas Cooper, 14 Fairmile Road, Sherwood Estate, Tunbridge Wells, England

Filed June 3, 1974, Ser. No. 476,098

Claims priority, application United Kingdom, June 7, 1973, 27146/73

Int. Cl.² A01K *89/02*

U.S. Cl. 242—84.52 C **5 Claims**



1. In a casting reel comprising a reel cage, a reel spool, and a bearing means rotatably mounting said spool within said cage, the improvement comprising a reel spool speed control device, said device including a cylindrical housing adapted to be secured to said reel cage and presenting a substantially circular inner surface, a rotatable disc member adapted to rotate with said reel spool and having a generally circular outer circumferential surface disposed radially inwardly of and spaced from said substantially circular inner surface of said cylindrical housing to define between said surfaces an annular braking chamber, wall means extending substantially completely across the annular axial ends of said braking chamber to substantially completely enclose said braking chamber, a plurality of speed control fingers, and pivot means individually freely pivotally mounting said fingers to said rotatable member, each said speed control finger being formed of lightweight wear-resistant material and being generally pawl-shaped having a boss portion around said pivot means and a pawl arm portion extending from said boss portion to present a smooth side surface and an opposite indented side surface and a tip surface, each said pawl-shaped finger being mounted on its pivot means with said indented side surface leading and said smooth side surface trailing with respect to the direction of rotation of the disc member during a casting action, whereby said speed control fingers are freely pivotable for movement under the combined influence of mutually oppositely acting centrifugal force and air-resistance force between retracted positions and deployed positions in which said tip surfaces lightly brush or are just clear of said substantially circular inner surface of said cylindrical housing, whereby to control a casting action.

3,944,161

TAPE LAYING DEVICE AND METHOD

Russell D. Kauf, R.D. No. 3, West Salem, Ohio 44287

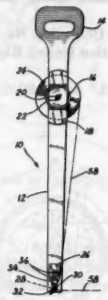
Filed July 10, 1974, Ser. No. 487,186

Int. Cl.² B65H *75/40*

U.S. Cl. 242—96 **6 Claims**

1. A portable device for laying warning tape, and the like, in a trench containing a utility cable, conduit pipe, or the like, comprising an elongated body portion having handle means at the upper end thereof and tape guide means at the lower end

thereof, said tape guide means being secured to one side of the body portion and extending outwardly therefrom, said body portion having a length such that a user can walk upright along an edge of a trench in which tape is being layed while gripping the handle means in one hand and maintaining the tape guide means at a desired level within the trench, and tape support means for holding a supply of tape in roll form to be layed in



the trench, said tape support means being positioned on the body portion below the handle means thereof and extending outwardly therefrom on the same side as the tape guide means, said tape support means including tape roll retaining means which is adjustable laterally with relation to the body portion to enable rolls of tape of different widths to be supported on the tape support means.

3,944,162

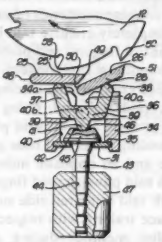
REEL FOR STORING BELTS OR THE LIKE

Cyril Henderson, Woodland Hills, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Apr. 20, 1973, Ser. No. 353,211

Int. Cl. B65h *75/48*

U.S. Cl. 242—107.4 A **14 Claims**



1. A reel for storing a belt or the like thereon comprising:

a frame having a shaft jounalled for rotation thereon;

a belt having one end connected to said shaft and adapted to be wound about said shaft;

spring means associated with both said shaft and said frame to revolve said shaft in a direction retracting said belt about said shaft;

a ratchet tooth gear circumferentially mounted on said shaft and rotatable therewith, said ratchet tooth gear having a plurality of spaced teeth thereon extending in the direction opposite the direction of revolution of said shaft by said spring means; and

means mounted on said frame for stopping the rotation of said shaft in the direction opposite the direction of revolution of said shaft by said spring means, said means including a pair of lockbars mounted on said frame, each of said lockbars having a pawl tip movable from a first position out of engagement with said ratchet tooth gear in a direction generally normal to the axis of rotation of said gear to a second position in engagement therewith, said pawl tips in said second position being spaced such that when the pawl tip of one of said lockbars is generally radially aligned with one of the teeth of said ratchet tooth gear the other of said pawl tips of the other of said lockbars is aligned midway between a pair of adjacent gear teeth of said ratchet tooth gear, said means mounted on said frame including differential lever means operatively engaging said lockbars for moving said lockbars between said first and second positions, said lever means having first and second portions thereon engaging each of said lockbars and a third portion thereon, and means associated with said frame operatively engaging said third portion to actuate said lever means in a manner whereby said lever means moves said lockbars between said first and second positions, said last-mentioned means moving to a lever means actuating position in response to inertia acting on said last-mentioned means and said differential lever means including a toggle member having a base member including said first, second and third portions thereon, said first and second portions being a pair of generally upwardly extending spaced arms with one of said arms bearing against the bottom of one of said lockbars and the other of said arms bearing agains the bottom of the other of said lockbars, and said third portion includes a downwardly extending button member generally rounded off at its lowermost end, said inertia responsive means including a weighted member having an integral upper head portion with a cavity on its upper surface, the roundedoff portion of said button member resting on said cavity and being movable thereon when said weighted member is moved between positons actuating said lever means.

3,944,163

SEAT BELT RETRACTOR

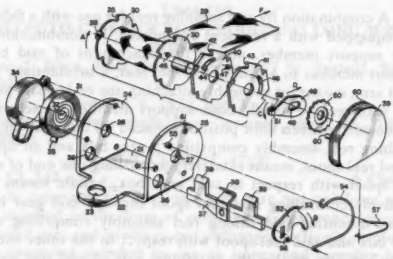
Yoshihiro Hayashi, and Kenji Matsui, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Mar. 18, 1974, Ser. No. 451,737

Claims priority, application Japan, Feb. 26, 1974, 49-23132[U]; Feb. 26, 1974, 49-23133[U]; Apr. 23, 1973, 48-45986; Mar. 24, 1973, 48-33702

Int. Cl.² A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.4 R **5 Claims**



1. A seat belt retracting apparatus comprising: a frame member; a spool mounted for rotation on said frame member and adapted to have a seat belt wound thereon; a retracting spring anchored at one end thereof to said spool for normally urging said spool in one direction of rotation to retract said seat belt on said spool; at least one locking wheel fixedly mounted on said spool and having a plurality of locking teeth on the outer periphery thereof; a locking plate having at least one locking portion engageable with one of said locking teeth when said seat belt is protracted and engages the body of a

passenger thereby locking said seat belt against further protraction, said locking plate being supported on said frame member so as to be movable between a locking position and an unlocking position; lock preventing means arranged for cooperation with said locking plate for temporarily unlocking said locking wheel to allow the rotation of said locking wheel in protracting direction over a predetermined number of said locking teeth after said engaged seat belt is retracted said predetermined number of locking teeth from the engaged position driving connection means between said locking wheel and said lock preventing means for drivably connecting said lock preventing means in interlocking relation with said locking wheel; and holding means for holding said lock preventing means on said retracting apparatus.

3,944,164

STORAGE DEVICE FOR A SAFETY BELT

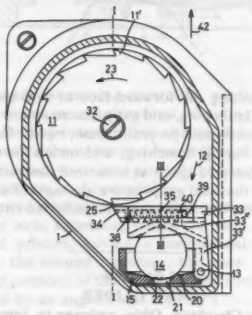
Günter Tibbe, Emmering, Germany, assignor to Hans Kolb KG, Munich, Germany

Filed Jan. 20, 1975, Ser. No. 542,290

Claims priority, application Germany, Jan. 23, 1974, 2403156; Feb. 5, 1974, 2405460

Int. Cl.² B65H *75/48*

U.S. Cl. 242—107.4 A **9 Claims**



1. A storage device for a safety belt with vehicle-sensitive locking of the belt in the direction of pullout, said device comprising a housing, a coiling shaft rotatably mounted in said housing, a ratchet wheel provided with peripheral teeth and with teeth on an end face, said ratchet wheel being axially movable on said coiling shaft, a pawl, an inertia member for moving said pawl into engagement with the peripheral teeth of the ratchet wheel, and teeth fast with the housing with which the end face teeth of the ratchet wheel co-operate and lock upon axial displacement of said ratchet, the pawl including a separately formed tip for engaging the peripheral teeth of the ratchet wheel, and means mounting said tip for displacement longitudinally of the remainder of said pawl under a predetermined loading in response to engagement with said ratchet wheel peripheral teeth.

3,944,165

DISPENSER FOR THREADED MATERIAL

Rose A. Badham, 2720 Oroville-Quincy Road, Oroville, Calif. 95965

Filed Apr. 4, 1974, Ser. No. 457,930

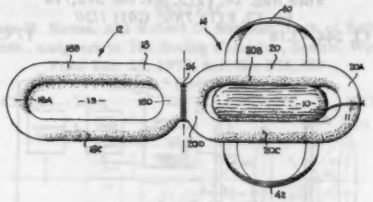
Int. Cl.² B65H *49/18*

U.S. Cl. 242—136 **8 Claims**

1. A threaded material dispenser comprising:

first and second contoured members, each said member having an oval plan and a depressed central region lineally surrounded by raised portions, said raised portions being substantially identical on said two members to allow the said raised portion said second member to sit on the said raised portion of said first member, said members being hinged together on one side thereof;

said dispenser being made of pliable material, and at least said raised portions being filled with granular material;



the space formed between said overlapping central regions being of sufficient size to hold at least one storage member of threaded material;

whereby threaded material may be dispensed from said storage member between at least one side of said raised portions of said first and second members.

3,944,166

PROCESS FOR COMPENSATING SHORT-TERM FLUCTUATIONS IN THREAD TENSION DURING FEEDING OF THREAD TO WINDING MACHINES AND THE LIKE

Peter Hermanns, Stommeln, Cologne, Germany, assignor to FMN Schuster & Co., Hurth-Efferen, Germany

Filed Nov. 7, 1973, Ser. No. 413,737

Claims priority, application Germany, Nov. 11, 1972, 2255443

Int. Cl.² B65H *59/10*

U.S. Cl. 242—147 A **5 Claims**

1. A method of compensating for short term fluctuations in thread tension during feeding of a thread to a working station that demands a varying amount of thread length during operation, said method comprising:

a. supplying thread to run freely along a straight path zone at a constant speed from a delivery zone,

b. said straight path zone having a downstream end and an upstream end,

c. blowing a first jet of fluid medium along the thread from the downstream end in a direction opposite to the direction of travel of the thread, and

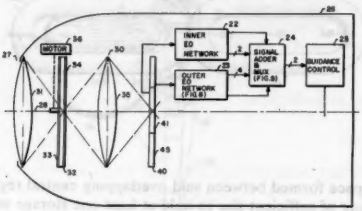
d. blowing a second jet of fluid medium along the thread from the upstream end toward said first jet,

e. said blowing jets of fluid medium being effective to produce a reserve supply of thread within the straight path zone by causing a thread deflection away from the straight path.

3,944,167
RADIATION DETECTION APPARATUS

Burton D. Figler, Winthrop, and Theodore J. Nussdorfer, Lexington, both of Mass., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Aug. 24, 1973, Ser. No. 392,714
Int. Cl. F11g *7/00*; G01j *1/20*
U.S. Cl. 244—3.16 **17 Claims**



1. Radiant energy sensing apparatus comprising:

a spectral filter including first and second spectral bandpass portions which pass radiations of long and relatively short wavelength, respectively

a centrally located detector element arranged to receive radiation passing through said first spectral bandpass portion of said spectral filter and which produces a set of signals, the amplitudes of which are a function of the position of an image of a point source target incident thereon; and

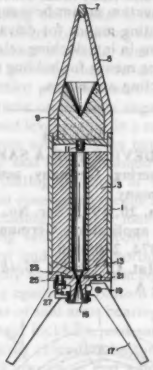
a plurality of separate detectors arranged to receive radiation passing through said first and second spectral bandpass portions of said spectral filter surrounding and equally spaced from the center of the centrally located detector and each arranged to produce an output signal in response to the imaging of a point source target thereon, said output signal having a particular characteristic depending on the spectral content of the point source target.

3,944,168
ARTILLERY PROJECTILE WITH SPREADING TAIL ASSEMBLY

Jean-Pierre Bizien, Chatillon-sous-Bagneux; Rene G. Patouilliart, Sevres, and Michel George, Colombes, all of France, assignors to Etat Francais, Paris Armees, France

Filed Mar. 7, 1974, Ser. No. 449,090
Claims priority, application France, Mar. 14, 1973, 73.09023
Int. Cl.[2] F42B *13/32*
U.S. Cl. 244—3.28 **14 Claims**

1. In an artillery projectile for launching by means of a launch tube, the combination comprising a spreading tail assembly on the base of the projectile, said tail assembly comprising fins that respectively pivot in a plane that passes through the longitudinal axis of the projectile, about an axis perpendicular to said plane, said fins having an internal edge with at least one projection, means forming an extension of the projectile base, a synchronization ring slidable concentrically on said extension of the projectile base from a forward position to a rear position to cause the simultaneous spreading of the fins and ensure their clamping in the spread position, means forming at least one axially oriented cylinder in the projectile base, a piston slidably mounted in each such cylinder for movement between forward and rear positions and constructed and arranged such that the rear face of said piston will be subjected to the pressure prevailing at the rear of the projectile base and hence the pressure in a launch tube during departure of the projectile, said synchronization ring having, on the one hand, first means cooperating with said at least one piston slidably seated in said cylinder in the projectile base, such that the rear face of said piston will be subjected to the pressure prevailing in a launch tube during departure of the round, to hold the synchronization ring in the forward position with said piston because of launch tube pressures during firing, and, on the other hand, second means cooperating with the said projections of the respective fins to hold the fins in folded position inside the launcher tube when the synchronization ring is held in the forward position, and gas pressure

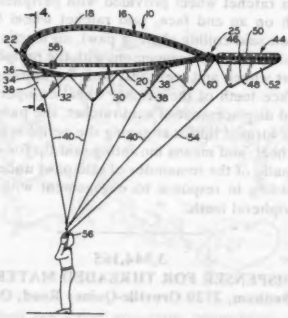


means for subjecting the forward face of said piston to gas pressure during launching, said gas pressure means comprising an enclosed space in said projectile base, means for pressurizing said space during launching, and means for preventing egress of gas from said space at least until destruction of said projectile, such that said gas pressure acts against said forward face of said piston throughout substantially the entire flight of said projectile.

3,944,169
HANG GLIDER

James R. Bede, Cleveland, Ohio, assignor to James R. Bede, Newton, Kans.

Filed July 12, 1974, Ser. No. 487,862
Int. Cl.[2] B64C *31/02*
U.S. Cl. 244—16 **19 Claims**



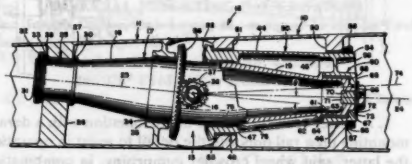
1. An aerial wing for soaring having opposite ends and a generally uniform airfoil-shape between said ends comprising, an envelope of flexible sheet material inflatable to said airfoil shape and having leading and trailing edges, the interior of said envelope defining chamber means, inflatable bladder means within said chamber means and including wall means separate from said envelope and providing an airfoil shape for said bladder means generally corresponding in contour to said

airfoil shape of said envelope, said bladder means being expandable and contractible within and relative to said chamber means and being sealed against fluid flow communication therewith, one of said chamber means and bladder means being adapted to receive and hold a quantity of gas, means defining air passageway means opening into the other of said chamber means and bladder means and having entrance means through said envelope adjacent said leading edge, and means to suspend a load beneath said wing.

3,944,170
APPARATUS FOR PRODUCING PIVOTAL MOVEMENT

Robert G. Musgrove, Arlington, Tex., assignor to LTV Aerospace Corporation, Dallas, Tex.

Filed June 20, 1974, Ser. No. 481,290
Int. Cl. B64c *3/48*
U.S. Cl. 244—44 9 Claims



1. Apparatus for causing controlled, relative pivotal movement of first and second structures, about a pivot axis, within a range extending between first and second extremes of pivotal movement, the apparatus being spaced along the pivot axis from at least one means pivotally connecting the first and second structures, and comprising:

an elongated member having a first portion, having a longitudinal axis, extending within the first structure and a second portion, having a longitudinal axis, extending within the second structure, the axes of the first and second portions of the elongated member being mutually skewed by an angle θ less than 90°;

first bearing means, rotatably mounting the member first portion within the first structure, for permitting rotational movement of the member about the axis of its first portion relative to the first structure but preventing yaw, and pitch, of the member relative to the first structure, the member being positioned with the junction of the axes of its first and second portions coincident with the pivot axis;

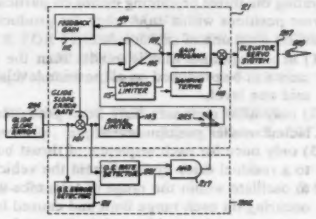
a housing extending within the second structure, second bearing means being provided for permitting rotation of the housing within the second structure about an axis intersecting the pivot axis at its intersection with the axes of the member first and second portion and for preventing yaw, and pitch, of the housing from its rotational axis relative to the second structure,the housing having a chamber open toward the pivot axis and receiving the second portion of the member, third bearing means being provided for permitting rotation of the member within the housing chamber about the axis of the member second portion and preventing yaw, and pitch, of the member relative to the housing, the rotational axis of the member within the housing being canted from the rotational axis of the housing within the second structure by an angle equal to the angle by which the axis of the member first portion is skewed from the axis of the member second portion; and

means for rotating the member upon the first bearing means, and for rotating the housing upon the second bearing means at an equal rotational velocity but in an opposite direction, the axes of the first and second portions of the member and the rotational axis of the housing lying in a single plane upon the first and second structures being positioned in the first and, alternatively, the second extreme of pivotal movement.

3,944,171
GLIDE SLOPE CONTROL SIGNAL PROCESSING SYSTEM

Jimmie H. Boone, and Robert D. Simpson, both of Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 23, 1974, Ser. No. 535,388
Int. Cl.² B64C *13/18*
U.S. Cl. 244—77 A 5 Claims



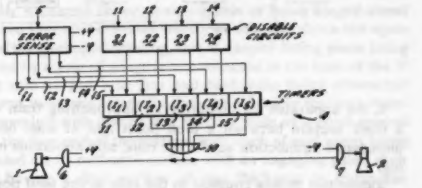
1. In combination in a pitch axis control system for an aircraft having longitudinal axis control surfaces:

means for generating a signal representative of glide slope error; means including a servo system connected to drive said longitudinal axis control surfaces; rate limited lag circuit means including an integrator circuit coupled between said means for generating a signal representative of glide slope error and said means including a servo system connected to drive said longitudinal axis control surfaces; and, logic circuit means connected in circuit between said means for generating a signal representative of glide slope error and said rate limited lag circuit means for controlling the output of said integrator circuit.

3,944,172
ATTITUDE CONTROL FOR SPACE VEHICLE

Klaus Becker, Bremen, Germany, assignor to ERNO Raumfahrttechnik GmbH, Bremen, Germany

Continuation-in-part of Ser. No. 350,916, April 13, 1973, abandoned. This application Feb. 3, 1975, Ser. No. 546,541
Claims priority, application Germany, Apr. 14, 1972, 2217949
Int. Cl.² B64G *1/00*
U.S. Cl. 244—169 5 Claims



1. Method of providing control for a space vehicle having thrust-producing means producing thrust for imparting momentum upon the vehicle thereby imparting motion upon the vehicle or reducing existing motion or reversing movement, further having control means for the thrust producing means causing the thrust producing means to produce thrust bursts or pulses, so that a controlled particular momentum is imparted upon the vehicle with each burst or pulse, such thrust burst being triggered by the control means respectively when the vehicle tends to move beyond selected descrete deviations

and error positions from a desired position, said descrete deviations establishing descrete position levels which in turn establish respectively levels for control and triggering of a thrust burst, one of the position levels being the highest one, comprising:

selecting the descrete position levels as levels for control triggering so that the highest one of said position levels, one in either direction as to deviation from the said desired position, are limit levels, defining a range of positional deviation tolerance;

operating the thrust producing means so that a relatively small momentum is produced when the vehicle tends to move past either of said limit levels;

operating the thrust producing means on particular levels of error positions within said range for producing momentum on each one of said levels

(1) at a magnitude that is smaller than the sum of momenta to be produced on all position levels higher than said one level;

(2) only after momenta have been produced for all selected smaller position levels;

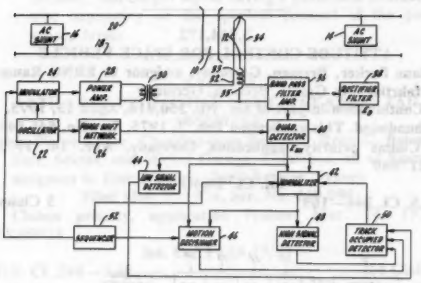
(3) only once for each sequence of thrust bursts leading to a residual error cycle wherein the vehicle is caused to oscillate within the range of tolerance with reversal occuring on each range limit and caused by said small momentum triggered in each instance when one of the range limits is reached.

3,944,173

RAILROAD CROSSING MOTION SENSING SYSTEM

James E. Moe, Upland; Richard V. Peel, Diamond Bar, and Richard E. Smith, Ontario, all of Calif., assignors to Saftran System Corporation, Louisville, Ky.

Filed Apr. 17, 1975, Ser. No. 569,302
Int. Cl.² B61L 21/06
U.S. Cl. 246—34 CT 24 Claims



1. An apparatus for detecting an approaching train within a track section between a feed point and at least one low impedance connection across the rails, said apparatus including:

transmitter means coupled to the rails at the feed point for applying a current to the track section,

receiver means coupled to the track section for producing a first signal representative of the impedance of said track section,

means for utilizing said first signal for detecting train motion, abnormally low impedance and abnormally high impedance,

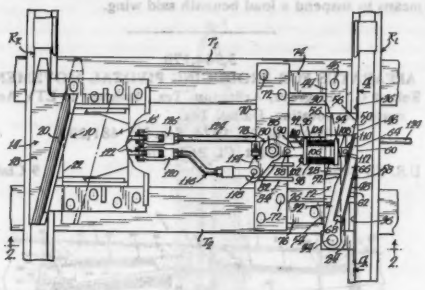
The improvement comprising a normalizer circuit connected to said receiver means for increasing or decreasing said first signal within predetermined limits in accordance with variations in impedance of said track section.

3,944,174

DERAIL WHEEL CROWDER

Leo E. Flinn, Countryside, Ill., assignor to Federal Sign and Signal Corporation, Blue Island, Ill.

Filed Sept. 20, 1974, Ser. No. 507,944
Int. Cl.² B61L 19/04
U.S. Cl. 246—163 8 Claims



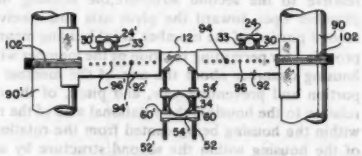
1. A wheel crowder for use in combination with a derail for mounting on a rail opposite the derail to assist in operation of the latter, said wheel crowder comprising, in combination, a crowder bar located along the inside of a first rail opposite a second rail on which a derail is mounted, said crowder bar being movable between an operative position where it engages the inside of said first rail and an inoperative position where it is spaced inwardly form said first rail, said crowder bar having a narrow tapered end portion which lies against the inside of an upper portion of said first rail when in its operative position thereby functioning as a wedge so as to enter between said upper rail portion and the flange on a wheel rolling on said first rail to force the wheel toward said second rail and thereby force the opposite wheel into the entering point of said derail, the sides of said narrow tapered end portion defining an included angle not substantially exceeding 15 degrees, and actuating means for moving said crowder bar between its operative and inoperative positions, said actuating means being responsive to actuation of said derail between its operative and inoperative positions.

3,944,175

PIPE SUPPORTS AND HANGER

Richard J. Kearney, 525 Kennerly Road, Springfield, Pa. 19064

Filed Oct. 4, 1974, Ser. No. 512,019
Int. Cl.² E21F 17/02; F16L 3/22
U.S. Cl. 248—59 8 Claims



1. In a universal pipe support and hanger employing a central body comprising a planar web and a pair of connected flanges wherein the central body is provided with an arcuately curved, transversely aligned, waste pipe contact section, and the flanges are provided with a plurality of longitudinally spaced small pipe receiving recesses, the improvement comprising

A. waste pipe clamp means maintained in fixed relationship to the central body to clamp the central body to a waste pipe which has a longitudinal axis, said central body having right and left ends,

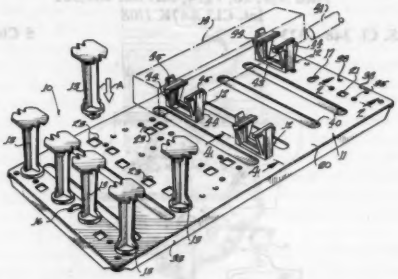
1. said waste pipe clamp means including a pair of elongated fasteners, a first pipe clamp secured by the fasteners, and a second pipe clamp secured by the fasteners,
2. said waste pipe clamp means including means to orient the plane of the web either in alignment with or at right angles to the longitudinal axis of the waste pipe, and
3. means to secure said first and second pipe clamps in a plurality of positions spaced from the central body,
4. said first and second pipe clamps securing the waste pipe therebetween to secure the support and hanger in stationary position.

3,944,176

UNIVERSAL MOUNTING BACKBOARD

Arthur Joseph Danko, Oak Lawn, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed June 24, 1974, Ser. No. 482,260
Int. Cl.² F16L *3/22*; H02B *1/02*
U.S. Cl. 248—68 R 12 Claims



1. A modularized device for mounting the terminals of telephone cables and the like, comprising an apertured backboard panel adapted to be mounted to a complementary support, a plurality of bracket means and one or more elongated terminal blocks, said backboard including a substantially planar portion and means for spacing the planar portion from the complementary support, the plurality of apertures in said support provided in a predetermined pattern of orientation; a plurality of said bracket means mounted in spaced relation on said backboard, said bracket means including a base for mounting each of said bracket means in juxtaposition relative to said planar portion, fastener means associated with the base of each of said bracket means and cooperative with one or more of the margins of said apertures to orient said bracket means relative to said planar portion in predetermined orientation patterns relative to each other, said bracket means further including one or more support pillars providing laterally spaced positive shoulder support means spaced from said base a substantial distance with said shoulder means lying in a plane substantially parallel to said panel and forming an open throat configuration adapted to permit said associated cables to be laid into and within said open throat of each of the said bracket means said throat extending longitudinally of the terminal block to be supported by said bracket means, each bracket means further including additional independently resilient means for receiving and retaining a portion of an associated terminal block positioned on said positive shoulder support means in spaced relation to said planar portion of the backboard and to capture the one or more cables laid into the bracket means between said base of said bracket means and the terminal block, each said terminal block being supported by at least two spaced bracket means mounted in spaced predetermined positioned apertures in said backboard suitably accepting and orienting one or more of a corresponding variety of differently dimensioned terminal blocks, the spacing between each said terminal blocks and the base of its cooperating bracket means base being adequate to permit each of the associated cables to be fed laterally with the individual wires in said cables being connectable to an individual terminal in said block, each bracket fastener means being insertable from the face of said planar portion opposite from said complementary support.

3,944,177

DEVICE FOR FIXING PIPES, RODS AND OTHER ELONGATED BODIES

Takuo Yoda, Yokohama, Japan, assignor to Nifco Inc., Tokyo, Japan

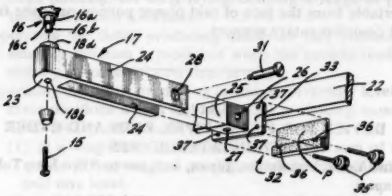
Filed Nov. 26, 1974, Ser. No. 527,340
Claims priority, application Japan, Dec. 5, 1973, 48-138911[U]
Int. Cl.² F16L *3/08*
U.S. Cl. 248—74 A 2 Claims

1. A one-piece plastic device for fixing elongated, cylindrical items relative to an apertured support structure, said device includes a base portion, anchoring means vertically provided on the under side of the base portion, a U-shaped housing portion provided on the top side of said base portion and having a pair of opposed vertical walls, each of said walls carrying an engaging projection extending inwardly from each wall in opposed relation adjacent the free end of each wall, an initially V-shaped fitting piece capable of being hinged about the base line of the V and initally positioned above the open end of the U-shaped housing, said V-shaped fitting piece being defined by a pair of wings interconnected at the base of the V along said hinged base line and each wing being connected adjacent its upper extremity through a flexible resilient strap-like member with one of said vertical walls at a point spaced from the free end of the vertical wall, each of said wings being provided on its outboard surface with an engaging pawl, each wing having a first portion of one thickness in transverse section for a substantial portion of its length adjacent the hinged base line and thence provided with a radiused portion of greater thickness than said first portion adjacent the free end of each wing and projecting toward the other wing to define a recess when said wings are folded about said hinged base line toward one another into opposed relation, said wings, when folded, being received within the throat formed by said U-shaped housing portion with said pawls engaging said projections adjacent the free end of the adjacent arm, whereby an elongated rod or the like is introduced into the recess of the wings being captured when said wings are folded inwardly and positioned within the U-shaped housing portion.

3,944,178
CABINET SUPPORT STRUCTURE

Richard H. Greenwood, Plymouth Meeting, Pa., assignor to Aeronutronic Ford Corporation, Blue Bell, Pa.

Filed Feb. 1, 1974, Ser. No. 438,566
Int. Cl.² A47F 5/00
U.S. Cl. 248—226 D 6 Claims

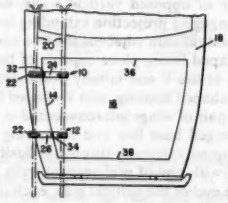


1. Bracket structure for supporting a cabinet or the like, comprising: a generally U-shaped main body having a loop portion and substantially parallel leg portions having confronting, generally planar surfaces; said loop portion including an enlarged section provided with a generally cylindrical opening extending perpendicular to the longitudinal dimension of said leg portions for receiving matching cylindrical pin means provided on a cabinet for mounting thereof on said structure; means for retaining said pin means in said opening; a generally cube-shaped block releasably retained for adjustable positioning between said planar surfaces of said leg portions; and an adjustable clamp including a base portion on one face of said cube-shaped block and extending transversely of, in close adjacency to, end regions of said leg portions, said clamp further including an adjustable portion disposed in spaced confronting relationship to said base portion, said clamp being adjustably presented for cabinet-supporting engagement with suitable ledge means.

3,944,179
CLAMP

Paul Alfred Piper, 1150 Balclutha Drive, Foster City, Calif. 94404

Division of Ser. No. 396,906, Sept. 13, 1974, Pat. No. 3,904,092. This application Sept. 19, 1974, Ser. No. 507,305
Int. Cl.² B60K 9/08
U.S. Cl. 248—226 R 5 Claims



1. A clamp for attaching a rack or other mechanism to the edge of the trunk lid or other planar edge portion of a vehicle having an underlying supporting member, said clamp comprising:

an armature comprising an elongate neck portion and a shoulder portion axially offset from said neck portion and joined to one end of said neck portion, said neck portion having another end adapted to be attached to the rack and an internal threaded aperture opening opposite said other end;

an L-shaped member comprising first and second relatively thin orthogonal flanges, said first flange attached to the shoulder portion of the armature, the second flange being adapted to be placed in abutment with the underside of said edge portion of said vehicle and having a lateral edge adapted to be maintained adjacent said supporting member;

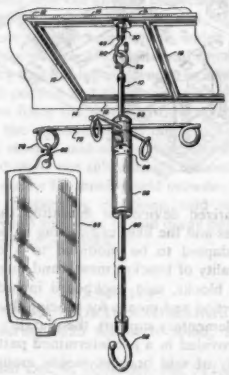
a bolt having one end threadably engaged with the threaded aperture in the neck portion of the armature, said bolt having a head portion at the other end for turning said bolt;

a planar member rotatably attached to the other end of the bolt and adapted to overlie a substantial portion of said supporting member so that said clamp is at least partially supported by said supporting member, said planar member having at least a portion adapted to be generally in parallel spaced opposition to the second flange of the L-shaped member so that rotation of the bolt moves the planar member nonrotatably with respect to said second flange to releasably secure the planar edge portion of the vehicle therebetween.

3,944,180
SUPPORTING APPARATUS FOR INTRAVENOUS CONTAINERS OR THE LIKE

Gerald L. Rogers, Webster Groves, Mo., assignor to Chemetron Corporation, Chicago, Ill.

Filed Apr. 26, 1974, Ser. No. 464,361
Int. Cl.² A47K 1/08
U.S. Cl. 248—323 5 Claims



1. A supporting apparatus for containers comprising:

a. a track adapted to be fastened to a ceiling, said track having a generally C-shaped cross section, said track having mitered joints to provide right angle turns;

b. a square carriage mounted for non-rotational movement in said track;

c. a support member having a shaft extending into said track through the opening in the C-shaped cross section, said shaft rotatably mounting said member on said carriage below said track, said shaft having an external thread;

d. a nut having a braking surface, said nut engaging said thread, said nut being connected to said carriage for non-rotational motion therebetween;

e. a first rod movably connected to said support member by a universal joint;

f. a second rod releasably connected to said first rod; and

g. a container holder having at least one container support mounted thereon, said holder being connected to said second rod for rotation therewith, said holder upon rotation also rotating said first and second rods and said support member to raise said nut to move said braking

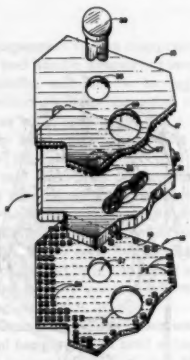
surface against said track to lock said carriage to said track, and opposite rotation lowering said braking surface from said track and allowing movement of said holder and square carriage via said universal joint through the right angle turns in said track.

3,944,181

ELASTOMERIC POST ARRAY MOUNTING STRUCTURE

Philip L. Anthony, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 9, 1974, Ser. No. 496,222
Int. Cl.² F16F 15/04
U.S. Cl. 248—358 R 7 Claims



1. An elastomeric post array mounting structure for suspending a precision device in any of a plurality of omnidirectional positions while minimizing the transmission of external stresses to the precision device, said structure comprising:

a first rigid support section having a first surface;

a first array of separate elastomeric first posts, each of said first posts having a first end attached to said first surface of said first rigid support section and a second end attached to a first surface of the precision device, each of said posts having a preselected cross-sectional-area and a preselected length between said first and second ends to achieve desired shear, tensile and compressive strengths for said mounting structure, said first array of separate elastomeric first posts acting collectively to suspend the precision device in a substantially fixed position relative to said first rigid support section for all orientations of said first rigid support section while minimizing the transmission of shear, tensile and compressive stresses to the precision device;

a second rigid support section having a second surface; and

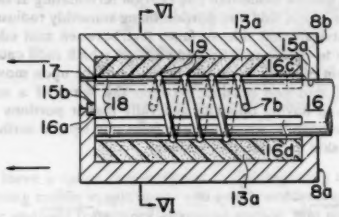
a second array of separate elastomeric second posts, each of said second posts have a third end attached to said second surface of said second rigid support section and a fourth end attached to a second surface of the precision device.

3,944,182

APPARATUS FOR MANUFACTURING HIGH-FREQUENCY COIL DEVICES

Tadafumi Yanagita, Kamifukuoka; Teruo Tamada, Asaka, and Yuma Tanaka, Iruma, all of Japan, assignors to Toko, Inc., Tokyo, Japan

Division of Ser. No. 358,060, May 7, 1973, abandoned. This application June 13, 1974, Ser. No. 478,867
Claims priority, application Japan, May 12, 1972, 47-46432
Int. Cl.² B22D 19/00
U.S. Cl. 249—83 1 Claim



1. An apparatus for manufacturing a high-frequency coil device comprising a coil element having a plurality of coaxial turns and a pair of connector leads integral therewith, and a generally cylindrical, hollow bobbin molded integrally with said coil element wherein the turns of said coil element are partially projected out of the outer surface of said bobbin and said connector leads are extended outwardly of said bobbin and substantially perpendicularly with respect to the axis of said coil element said apparatus comprising a pair of molds, and a rod-like mandrel, each of said molds including a semi-cylindrical recess and substantially flat surface portions formed in a molding surface thereof, said substantially flat surface portions extending in opposite directions from the opposite sides of said semi-cylindrical recess respectively, a pair of walls for enclosing the recesses in cooperation with said mandrel when said molds are closed, and an aperture formed in one of said walls of one of said molds for permitting of the injection of a molten resin material into a mold cavity defined by said molds and said mandrel, said mandrel adapted to receive a coil element thereon and said molds, when closed, adapted to receive said mandrel with said coil element thereon within said mold cavity such that when the molten resin material is injected into said mold cavity, a bobbin integral with said coil element is formed, characterized in that each of said molds further includes a resilient layer provided on said molding surface, said resilient layer comprising a semi-cylindrical portion corresponding to said semi-cylindrical recess and substantially flat portions corresponding to said substantially flat surface portions respectively, said resilient layer being of such a thickness that when said molds are closed said coaxial turns of said coil element are compressively engaged thereby and only partially buried therein and said connector leads of said coil element are held in a fluid tight manner between said substantially flat portions thereof so as to be isolated from said mold cavity; and that said resilient layer has a pair of stepped portions provided between said semi-cylindrical portion and said substantially flat portions thereof and extending along the opposite sides thereof respectively.

3,944,183

CHANNELING WEDGE

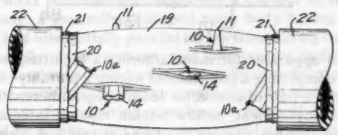
James R. Miller, Oakdale Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 388,402, Aug. 15, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,401
Int. Cl.² H02G 15/20
U.S. Cl. 254—104 3 Claims

1. A channeling wedge for forming passageways to allow the introduction of resin between the wires of a multiwire cable,

said channeling wedge comprising a broad longitudinal polymeric member having a tip end surface with a substantially greater length than width dimension; an end surface opposite said tip end surface adapted to receive force to move the wedge, tip end surface first, between the wires of a said cable; opposite edge surfaces having essentially the same width dimension as said tip end surface, being aligned with said tip end surface, and extending from said tip end surface to said opposite end surface; and opposite broad side surfaces joining said tip end surface, said opposite end surface and said edge surfaces, which polymeric member:

includes a narrow blade-like end portion terminating at said tip end surface, said end portion being smoothly radiused both between said side surfaces and between said edge surfaces to define said tip end surface, which radii cause deflection of wires from said tip end surface upon movement of said end portion between the wires of a said cable, and having opposite generally planar portions of said side surfaces which diverge from said tip end surface toward said opposite end surface;



includes longitudinal outwardly projecting wedge-like edge portions which define said edge surfaces and diverge from each other longitudinally from said tip end surface toward said opposite end surface, and which wedge-like edge portions each define opposite portions of said side surfaces that diverge from the associated edge surface toward a central portion of the polymeric member, said edge surfaces and planar side surface portions which diverge from said tip end surface and said diverging portions of said side surfaces on said wedge-like edge portions being adapted to smoothly increase the separation between wires deflected by said tip end surface and to open passageways for the resin adjacent said edge surfaces during movement of said channeling wedge between the wires of a said cable; and

has a groove along each of said side surfaces between said wedge-like edge portions extending from said opposite end surface to said end portion, the grooves along said side surfaces, upon insertion of said channeling wedge through a said cable, providing passageways for resin between the side surfaces and said wires.

3,944,184

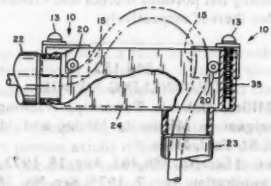
PULLING ATTACHMENT FOR ELBOW

Reinhold Fisch, 29 Elenor Place, Yonkers, N.Y. 10705

Filed May 8, 1975, Ser. No. 575,899

Int. Cl.² B66D 1/36

U.S. Cl. 254—134.3 R **9 Claims**



1. A pulling attachment for use with an electrical fitting having opposed side walls, a bottom wall, an open top, and openings in its walls through which a cable can be passed, comprising a mounting plate, means on the mounting plate for attaching the mounting plate to the opposed side walls of the electrical fitting, said attaching means comprising means forming substantially parallel channels for fitting over and receiving the electrical fitting side walls, means connected to the channelforming means for engaging the fitting side walls for securing the attachment to the fitting, and a roller journalled on the attaching means and extending parallel to the mounting plate, said roller being located in a position such that when the attachment is mounted on the electrical fitting adjacent a wall opening and the cable passed through the opening and pulled through the open top, the upper side of the cable bears against the roller when viewed from the top.

3,944,185

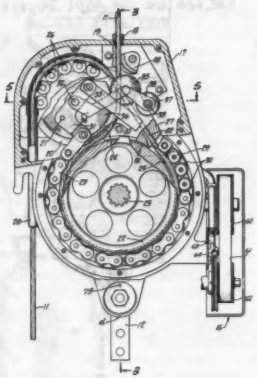
HOIST APPARATUS

Michael J. Evans, Los Angeles, Calif., assignor to Mayco Equipment Co., Inc., Los Angeles, Calif.

Filed June 28, 1974, Ser. No. 483,981

Int. Cl.² B66D 1/76

U.S. Cl. 254—175.5 **13 Claims**



11. Hoist apparatus for powering a load along a cable or the like, comprising:

a housing;

a first sheave rotatably mounted to said housing and drivingly interconnected with a rotative power source, the circumference of said sheave being formed into a continuous groove;

a second sheave having a grooved circumference mounted for axial rotation coplanar with said first sheave and with its circumferential groove lying opposite that of said first sheave;

means mounting said second sheave to said housing for eccentric swinging movement toward and away from said first sheave;

said cable being received into that portion of the groove of said second sheave lying opposite said first sheave and thence engaging the groove of said first sheave before exiting from the housing;

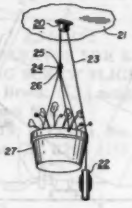
flexible chainlike means received over the cable in the first sheave groove; and

bell crank means pivotally mounted onto said second sheave and having each of its respective ends interconnected with an end of said chainlike means, whereby movement of said second sheave with respect to said first sheave varies the engagement force of the chainlike means with the cable.

3,944,186
LOCKING PULLEY ASSEMBLY AND METHOD OF MAKING SAME

Ruediger Einhorn, Katonah; Lee Richard Chasen, Port Chester, and Karl Hannes, White Plains, all of N.Y., assignors to Coats & Clark, Inc., New York, N.Y.

Filed Feb. 14, 1975, Ser. No. 550,162
Int. Cl.² B66D 1/36
U.S. Cl. 254—191 **4 Claims**



1. An article suspension system comprising a hoisting means and a pull cord and handle assembly comprising a cord, and an elongated handle, said handle having a hole extending lengthwise therethrough with the axial center of said hole having a diameter substantially the same as the diameter of said cord and the axial ends of said hole having a diameter greater than the diameter of the center thereof, said cord extending into said hole and having an enlarged portion therein whereby displacement of said cord in said hole is inhibited in one direction, said handle further having lengthwise extending slots which also extend across each end thereof and having a width slightly less than the diameter of said cord, said slots intersecting said hole and being in a common plane, whereby said cord may be inserted and wrapped about said slots and held thereby.

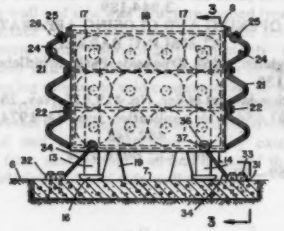
3. An article suspension system comprising a locking pulley, a handle, a swivel hanger, and a cord extending between said handle and said hanger by way of said locking pulley, said locking pulley comprising a cylindrical unitary body of a die casting metal having a circumferential groove and coaxial frustoconical bearing surfaces formed at its ends, and a unitary frame member with mounting means and spaced apart frustoconical surfaces engaging the bearing surfaces of said cylindrical body for forming rotary joints, said cylindrical body further having locking grooves extending from said circumferential groove, said frame having a surface spaced from the circumferential surface of said cylinder a distance less than the diameter of said cord, said handle comprising an elongated cylindrical member having an axial hole extending therethrough with a central portion of substantially the same diameter as said cord and axial end portions of greater diameter than said cord, and an axially extending slot at each end of said cylindrical member of a width less than the diameter of said cord but sufficiently large to permit said cord to be inserted therein, said slots being coplanar, said cord extending through said central portion of said hole and having a knot on its end to inhibit removal of said cord from said handle, said swivel hanger comprising a first member to which said cord is affixed and a second member freely pivotally coupled to said first member for holding said article.

3,944,187
ROADWAY IMPACT ATTENUATOR

Grant W. Walker, Sacramento, Calif., assignor to Dynamics Research and Manufacturing, Inc., Sacramento, Calif.

Filed Sept. 13, 1974, Ser. No. 505,636
Int. Cl.² A01K 3/00
U.S. Cl. 256—13.1 **7 Claims**

1. A roadway impact attenuator adapted to be supported on the ground on which traffic advances in a predetermined direction comprising a framework, means for supporting said framework perpendicular to said direction and for sliding movement on the ground in said direction, a barrier perpendicular to said direction and separated from said framework

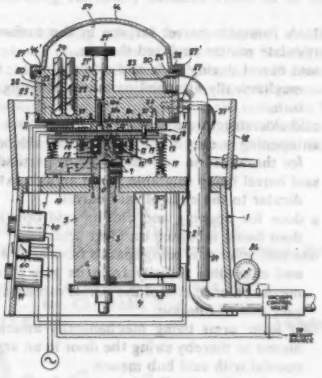


to leave a space therebetween, a disintegrating energy converting means in said space and interposed between said barrier and said framework, a ground anchor, and means releasable by movement of said framework in said direction connecting said ground anchor to said framework.

3,944,188
CONCENTRATING VORTEX SHAKER

Bernard Parker, Westport, Conn.; Otto Gross, Bergenfield, and Joseph Buchler, Fort Lee, both of N.J., assignors to Buchler Instruments Div. of Searle Analytic Inc., Fort Lee, N.J.

Filed May 20, 1974, Ser. No. 471,751
Int. Cl.² B01F 11/00
U.S. Cl. 259—54 **11 Claims**



11. A vortex shaker comprising:
a base;
a motor in said base;
a heat-conductive block mounted movably on said base and connected to said motor for gyratory movement of said block by said motor, said block being formed with a plurality of upwardly open pockets adapted to receive sample vessels;
means for selectively heating and cooling said block to vary the temperature thereof;
a cover detachably engaging said block and enclosing said pockets while forming a hermetic seal with said block while defining a chamber above said pockets common to all said pockets;
suction means communicating with said chamber for inducing a suction therein; and

control means connected to said suction means for regulating the generation of suction in said chamber to prevent bumping of said liquid in said vessels.

3,944,189

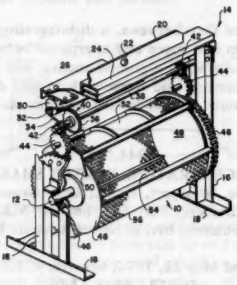
DOOR OPENING AND CLOSING APPARATUS FOR TUMBLING BARREL

Albert Singleton, 7360 Brookside Park, Middleburg Heights, Ohio 44130

Continuation-in-part of Ser. No. 419,815, Nov. 28, 1973, Pat. No. 3,861,654. This application June 24, 1974, Ser. No. 482,743

Int. Cl.² B01F 9/02

U.S. Cl. 259—89 11 Claims



1. A rotatable barrel for use in the surface treatment of particulate matter enclosed therein,

said barrel having ends and side structure, said ends being mechanically attached to means forming the side structure,

said side structure means being foraminous,

an opening means in said foraminous side structure means for the insertion and discharge of particulate matter,

said barrel being rotatable about an axis extending perpendicular to the ends of said barrel,

a door for opening and closing said opening means, said door being mounted on lever arms,

one said lever arm being spaced from each end of the barrel and extending radially from its axis of rotation, a hub means on each end of the barrel extending coaxially with said axis of rotation,

said lever arms being mechanically attached to the hub means to thereby swing the door in an arc having an axis coaxial with said hub means,

stop means for limiting the angle of said arc in which said door may swing relative to the barrel,

at least one of said lever arms being mechanically attached to a gear mounted on one side of said hub means whereby, rotation of said gear in one direction drives the door to closed abutting position against one of said stop means and the barrel is thereafter rotated by force exerted by (1) the gear, (2) the attached lever arm and (3) the door pushing against the stop means,

the stop means in abutment with the door comprising an L-shaped channel member welded to the periphery of said barrel adjacent one edge of the opening means and extending from one end to the other,

the portion of the door abutting the stop means comprising a radially inwardly extending flange whereby the abutting flange and stop means serve to seal one edge of the opening against loss of the particulate matter during tumbling.

3,944,190

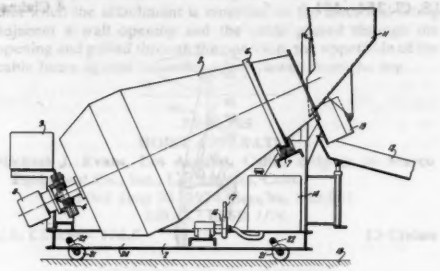
TRANSIT MIX SYSTEM AND METHOD, AND SUPPORT FOR TRANSIT MIX UNIT

Paul E. Dunmire, 12 Lawridge Road, Santa Cruz, Calif. 95060

Filed Feb. 21, 1974, Ser. No. 444,390

Int. Cl.² B28C 5/18

U.S. Cl. 259—177 R 10 Claims



6. The method of rendering a truck useful for other loads in a transit mix system wherein a portable transit mix unit is mounted on the bed of a truck, which comprises providing support rollers on the unit enabling it to be moved readily, movably connecting said rollers to said unit for selectively elevating and lowering said unit out of or into fixed engagement with said truck bed, providing a support having a support platform for said unit, backing the truck adjacent the front of the platform, with the unit elevated relative to said bed, rolling the unit from the truck bed onto the platform, and when such unit is to be used again on the truck rolling it from the platform onto the truck bed, and subsequently lowering said unit into fixed engagement with said truck bed.

3,944,191

PLASTICS-PROCESSING MACHINE WITH COMBINED PERFORMANCE OF EXTRUSION AND INJECTION

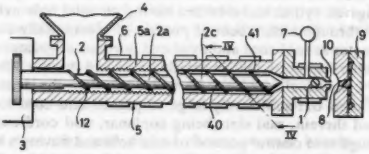
Tadashi Kasamatsu, 6-10, 2-chome, Shiratori, Katsushika, Tokyo, Japan

Filed Nov. 29, 1973, Ser. No. 420,155

Claims priority, application Japan, Dec. 11, 1972, 47-124689

Int. Cl.² B29B 1/06

U.S. Cl. 259—191 5 Claims



1. A plastics extrusion-injection molding machine having:

a cylinder including three portions for supply, compression and melting through which plastic material is conveyed in that order,

a screw having a longitudinal axis rotatably inserted in said cylinder for conveying plastic material through the clearance between said cylinder and said screw,

a nozzle attached to the downstream end of said cylinder for extruding and injecting the plastic material there through into a mold which is removably attached thereto, and

a valve mounted in said nozzle for controlling the opening of the same, the improvement which comprises:

boosting means formed in the supply portion of said cylinder for allowing the plastic material to fully occupy such portion of said clearance as corresponds to said supply portion so as to boost the pressure upon the plastic material within the cylinder,

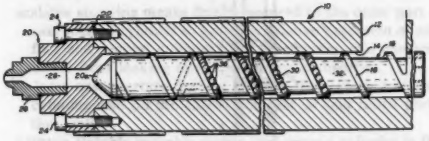
back-flow means in the melting portion of said cylinder for allowing the plastic material to flow backwardly therethrough to mitigate abnormally high pressure from being built up in said melting portion, said back-flow means comprising a plurality of grooves that extend through the threads of said screw, and are bounded by surfaces which are parallel to the longitudinal axis of said screw.

3,944,192

PLASTICIZER APPARATUS FOR BALL AGITATOR ALONG SCREW FLIGHTS

John J. Farrell, Green Brook, N.J., assignor to Farrell Patent Company, Green Brook N.J.

Filed Dec. 19, 1973, Ser. No. 426,040
Int. Cl.² B29B 1/10
U.S. Cl. 259—191 12 Claims



3. Plasticizer apparatus for injection molding machines including in combination a plasticizer screw having a shank portion and a helical thread portion that extends radially beyond the circumference of the shank portion and that forms flights for propelling plastic material lengthwise of the screw in a forward direction as the screw rotates, a helical groove in the surface of the shank portion adjacent to the rearward side of the thread portion, balls in the groove and movable in the groove to agitate plastic material which is adjacent to the rearward surfaces of the flights when the plasticizer apparatus is in operation, characterized by the balls being located in the groove adjacent to one another whereby the balls form a substantially continuous line of balls and movement of any ball along the length of the groove can move the next ball by contact therewith, further characterized by an abutment surface at the forward end of the groove, a passageway extending lengthwise of the screw and having an entrance end at said abutment surface so that balls moving up to the abutment surface can enter the passageway, said passageway being of sufficient cross section for balls to travel through the passageway, and an outlet end of the passageway located adjacent to the rearward end of the line of balls and from which balls can re-enter the groove.

3,944,193

METHOD AND APPARATUS FOR FORMING BY VIBRATION A REFRACTORY LINING OF A CONTAINER FOR A MOLTEN METAL

Hiroyuki Imai, and Rikuo Kaharu, both of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Division of Ser. No. 389,633, Aug. 21, 1973. This application June 5, 1974, Ser. No. 476,451
Claims priority, application Japan, Aug. 26, 1972, 47-85555; Sept. 2, 1972, 47-88056; Dec. 16, 1972, 47-126550
Int. Cl.² B22C 9/12, 15/10
U.S. Cl. 266—1 R 5 Claims

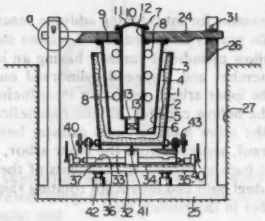
1. Apparatus for applying a refractory lining to the inner wall surfaces of a container which is open at the top and is used for holding molten metal, said apparatus comprising a stand unit on which said container can be received, a molding box including:

a bottom wall,

space encircling side wall structure extending upwardly from said base,

said bottom wall having passage means extending therethrough, said bottom wall and side wall structure defining an upright open top housing, means for covering the top of said housing, means for suspending said housing disposed within said container with the outer surface of said bottom wall and side wall structure spaced from the inner wall surface of said container, means for vertically and two-dimensionally horizontally adjustably positioning said stand unit whereby the positioning of said molding box housing relative to said container can be correspondingly altered, said molding box further including,

a closed vessel for holding refractory material which can be vibrated and given thixotropic fluidity extending upwardly from said bottom wall and disposed thereon centrally relatively of said side wall structure,



means for selectively establishing communication between the interior of said closed vessel and the passage means in said bottom wall whereby refractory material present in said vessel can be conveyed therefrom through said passage means and into said container, and

means for vibrating refractory material received in said vessel,

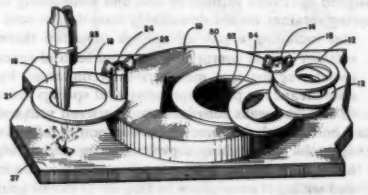
said closed vessel having a lid at the top thereof, said lid carrying exhaust pipe means with which the interior of said vessel can be communicated with a source of vacuum for degassing refractory material therein, and pressure pipe means with which the interior of said vessel can be connected with a source of compressed gas to facilitate conveying said refractory material from said vessel into said container.

3,944,194

METAL CUTTING TOOL GUIDE

Lawrence V. Robinson, 2323 Mesquite Ave., Las Vegas, Nev. 89101

Filed Feb. 21, 1974, Ser. No. 444,305
Int. Cl.² B23K 7/10
U.S. Cl. 266—23 E 13 Claims



1. A device for guiding a cutting torch on a magnet attracting metal surface comprising:

a magnetized base member, having a top surface having first means thereon for securing a guide member having a shaped surface for guiding said cutting torch, and a second means for holding a plurality of said guide members.

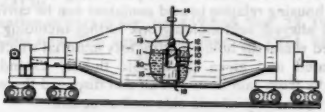
3,944,195
APPARATUS FOR FEEDING GRANULAR MATERIAL TO A STEEL BATH

Eugene F. Buell, 301 Fifth Ave., Pittsburgh, Pa. 15222

Continuation-in-part of Ser. No. 431,771, Jan. 8, 1974, abandoned, which is a continuation of Ser. No. 350,000, April 11, 1973, abandoned. This application Sept. 19, 1974, Ser. No. 507,541

Int. Cl.² C21C *7/00*

U.S. Cl. 266—34 A **14 Claims**



1. An apparatus for introducing additive reactive agents of lower specific gravity than steel into a molten steel bath comprising a hollow cylindrical canister having an inner cylindrical arbor member and a spaced cylindrical outer wall connected to the inner arbor, means for introducing an additive agent into the hollow canister, at least one helical vane in the interior of the arbor member, said canister having at least a portion thereof, separate from the inner arbor, fusible in the molten steel bath to release the contents of the canister into the molten steel bath and means for rotating said canister and arbor member in the molten steel.

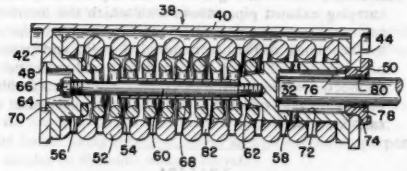
3,944,196
RECOIL SPRING HOUSING ASSEMBLY

Glen E. Schwartzkopf, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 24, 1974, Ser. No. 473,138

Int. Cl.² F16F *1/06*

U.S. Cl. 267—4 **6 Claims**



1. Track recoil mechanism comprising:

an elongated unitary housing having an axis and a pair of spaced apart end walls connected a fixed distance apart along said axis by side wall means including a pair of flanges for securing said housing between a pair of spaced apart horizontally extending parallel side rails;

aligned apertures formed in said end walls along said axis;

spring retainer means detachably mounted in said housing and including a pair of springs mounted therein, said retainer means comprising first and second spaced apart annular spring seat members interconnected by adjustable means for precompressing said springs independent of said end walls for placement between said end walls;

said end walls being spaced a predetermined fixed distance apart for establishing a pretension in said springs when said spring seat members engage and are confined by said end walls;

said first spring seat member including pilot means extending into one of said apertures for retaining said assembly in place;

the second of said seat members having a cupshaped portion opening toward the other of said apertures for receiving an idler rod of a yoke assembly extending through said aperture; and,

a sleeve extending through said aperture and engaging said cup portion for retaining same in place in said housing.

3,944,197
HYDROPNEUMATIC SUSPENSION DEVICE

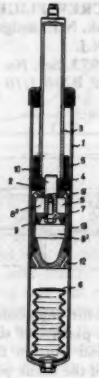
Augustin Dachicourt, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Sept. 11, 1974, Ser. No. 505,018

Claims priority, application France, Sept. 12, 1973, 73.32809

Int. Cl.² F16F *5/00*

U.S. Cl. 267—64 R **4 Claims**



1. In a hydropneumatic suspension device comprising as conventional a cylinder containing liquid and gas, a piston provided with valve means loaded by spring means, said piston being disposed at the end of a hollow rod filled with liquid under pressure, and means for compensating the thermal expansion of said liquid and gas, which act as a pneumatic spring in case of temperature increments, said compensating means comprising an auxiliary chamber containing a gaseous fluid under pressure and having a movable wall responsive on one side to the pressure of said gas and on the other side to the pressure of the liquid contained in said cylinder and also to the pressure of the liquid contained in said closed volume of said rod, said chamber being rigid with said piston.

3,944,198
IMPACT ABSORBER

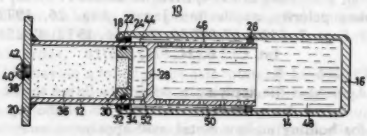
Mitsuhiro Sakamoto, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Dec. 2, 1974, Ser. No. 528,744

Claims priority, application Japan, Nov. 30, 1973, 48-137984

Int. Cl.² F16F *5/00*

U.S. Cl. 267—116 **5 Claims**



1. An impact absorber comprising:

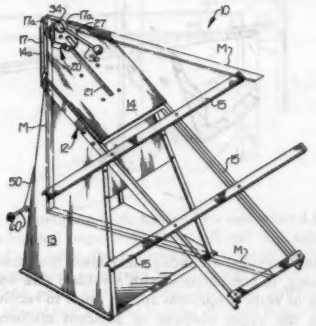
a first cylinder having a closed end;
damping liquid in said first cylinder;
a second cylinder closed at one end and having a radial partition wall therein, said second cylinder being longitudinally movable within said first cylinder for transmitting an impact force to said damping liquid;
a sealing member fixedly secured to the inner part of said first cylinder;
a first chamber defined by the wall and closed end of said first cylinder, the radial partition wall and the portion of said second cylinder on the side of said radial partition wall therein facing inwardly of the first cylinder toward the closed end thereof and said sealing member;
a plurality of longitudinally aligned throttling ports formed through said second cylinder on the side of said radial partition wall defining said first chamber, said damping liquid being forced through said throttling ports upon movement of said second cylinder to thereby provide a variable orifice effect in cooperation with said sealing member with a self-regulating response to changing impact conditions and to dampen a wide range of impact forces;
sealable stopping means fixedly secured to the outer part of said second cylinder to limit the relative extension of said first and second cylinders and to prevent said damping liquid from leaking out of said impact absorber;
at least one aperture formed radially through said second cylinder wall on the closed end side of said radial partition wall;
a piston slidably movable within said second cylinder in the closed end side thereof;
a second annular chamber defined by the inner surface of said first cylinder, the outer surface of said second cylinder, said sealing member and said sealable stopping means and communicating with said first chamber through said throttling ports;
a third chamber defined by the portion of said second cylinder on the side of said radial partition wall therein facing the closed end thereof, said partition wall and said piston and communicating with said second annular chamber through said aperture, said damping liquid within said first chamber being forced through said throttling ports to said second annular chamber and from said second annular chamber through said aperture to said third chamber thereby urging said piston toward the closed end of said second cylinder responsive to an impact force on said closed end of said second cylinder;
a fourth chamber defined by the portion of said second cylinder between said closed end thereof and said piston; and
restoring means in said fourth chamber for biasing said piston toward said partition wall to thereby serve as an additional dampening force for dampening said impact force and for returning said damping liquid within said third chamber to said second annular chamber and then to said first chamber after the dampening of said impact force such that said impact absorber may dampen successive impact forces.

3,944,199
WORK HOLDER AND CATCH PAN
Ernst S. Johnson, 515 Garwood St., Oakhurst, N.J. 07755
Filed July 10, 1975, Ser. No. 594,778
Int. Cl.² B23Q *3/00*
U.S. Cl. 269—15 **9 Claims**

1. A device for servicing a fluid-containing portion of a vehicle comprising:
a catch pan, substantially larger than said fluid-containing portion of said vehicle, having a centrally-located drain hole;
a work holder fitted into said catch pan, and extending substantially above said catch pan, said work holder having a central portion for supporting said fluid-containing portion of said vehicle;
means for securing said work holder within said catch pan;

means for supporting said catch pan and work holder in a desired relationship with said fluid-containing portion of said vehicle; and
means for catching any residue from said centrally-located drain hole of said catch pan.

3,944,200
WORKPIECE CLAMPING AND POSITIONING APPARATUS
James R. Huntley, 309 W. Crowell St., Monroe, N.C. 28110
Filed Oct. 2, 1974, Ser. No. 511,211
Int. Cl.² B25B *1/20*
U.S. Cl. 269—42 **15 Claims**



1. Clamping device for quickly and accurately positioning and maintaining a pair of workpieces in predetermined, generally end-to-end angularly related positions and being characterized by evenly and resiliently applying clamping forces and positioning forces to the pair of workpieces regardless of slight variations in width of the workpieces, said clamping device comprising
backstop means having respective angularly related surface portions positioned for receiving the respective outside longitudinal side edges of the workpieces and for positioning the workpieces in predetermined angularly related positions with respect to one another defining a predetermined included angle therebetween.

slide block means located within the included angle formed by the workpieces when positioned against said backstop means and mounted for movement along a longitudinal axis toward and away from the workpieces and said backstop means,

a pair of separate gripper means operatively connected to and carried by said slide block means in side-by-side transversely spaced relation to one another and having portions thereof facing toward said backstop means and defining workpiece engaging surfaces,

said pair of gripper means being operatively connected to said slide block means for simultaneous movement with the slide block means longitudinally toward the workpieces and said backstop means for engaging the inside longitudinal edges of the respective workpieces and for clamping the workpieces against said backstop means, and also being operatively connected to said slide block means for allowing independent, generally transverse movement relative to one another, so that upon engagement of the gripper means with the respective inside edges of the workpieces the gripper means may move transversely toward one another for sliding the workpieces toward each other for a tight end-to-end abutment, and

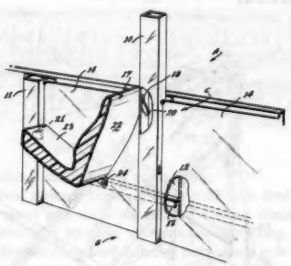
resilient means cooperating with each of said gripper means for biasing and cushioning the gripper means in opposition to transverse movement of the gripper means toward one another for thereby insuring substantially equal and even applications of the clamping and positioning forces by said gripper means to the respective workpieces regardless of slight variations in width thereof.

3,944,201

TAB STYLE CANTILEVER SEAT MOUNT

Keith W. Tantlinger, Coronado, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Nov. 8, 1974, Ser. No. 522,219
Int. Cl.² B60N 1/00
U.S. Cl. 296—63 **10 Claims**



1. Cantilever seat mounting mechanism for a transit vehicle comprising, in combination with a vehicle side wall having a plurality of vertical mullions spaced apart to receive windows between the upper portions of adjacent mullions with the lower portions of the mullions below the windows covered exteriorly by structural material, and each of the mullions projecting inwardly into the interior of the vehicle,

a passenger seat comprising a generally upright back portion and a generally horizontal seat portion, said back and seat portion being joined together to define a selected seating angle, one end of the seat being the wall end thereof,

a first seat mounting member, on, and extending forwardly from, a forward portion of the seat portion of said seat at the wall end thereof,

a second seat mounting member on, and extending rearwardly from, an upper portion of the back portion of said seat, also at the wall end thereof,

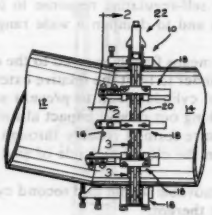
mounting member engaging means at respectively selected heights on the forwardly and rearwardly facing sides, respectively, of each of the inwardly projecting portions of two adjacent mullions of such side wall between which two mullions the seat is to be mounted, each of said engaging means being constructed and located to receive, and have interlocking, supporting engagement with, one of said mounting members.

3,944,202

CLAMPING DEVICE FOR USE IN MAKING MITERED JOINTS IN PIPE SECTIONS

Timothy C. Dearman, 4191 E. Stanley Road, Mount Morris, Mich. 48458

Filed Aug. 19, 1974, Ser. No. 498,590
Int. Cl.² B23K 1/14
U.S. Cl. 269—130 **5 Claims**



1. Apparatus for clamping a pair of pipe lengths having confronting ends abutting one another and forming a joint therebetween, said apparatus comprising a flexible member forming a loop of such size as to encircle one of said pipe lengths adjacent its end; a plurality of housing members circumferentially spaced about said loop and encircled by said flexible member; an elongate jackbar slidably accommodated in each of said housing members for sliding adjustment transversely of said loop and being engaged by said flexible member, each of said jackbars being of such length as to enable one end thereof to extend beyond said joint and overlie the other of said pipe lengths; clamp means carried by said one end of each of said jackbars for clamping engagement with said other of said pipe lengths; and means for varying the size of said loop when said flexible member encircles said one pipe length whereby said flexible member selectively enables and disables adjustment of said housing members circumferentially of said loop and slidable adjustment of said jackbars relative to their housing members.

3,944,203

OXIDATION CUTTING WORK SUPPORT MEANS

Erwin C. Brekelbaum, 6831 N. Neil Place, Glendale, Wis. 52309

Continuation of Ser. No. 420,512, Nov. 30, 1973, abandoned.
This application Dec. 26, 1974, Ser. No. 536,420
Int. Cl.² B23Q 3/00
U.S. Cl. 269—296 **17 Claims**

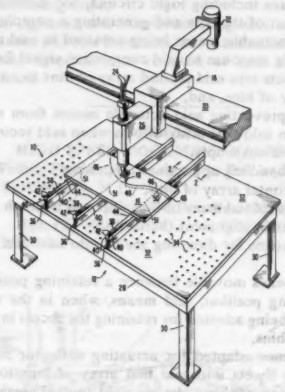
1. A material support for an oxidation cutting operation comprising:

longitudinally extending stanchion means for operatively underlying and supporting, at least in part, material to be cut by an oxidation cutter, and

longitudinally extending tip means operatively connected to said stanchion means and projecting above said stanchion means for supporting the material to be cut,

said tip means in cross section having a recess in the bottom thereof for receiving a portion of said stanchion means, and angled side portions, said side portions extending from a base portion inwardly and upwardly from said base portion to define an upwardly directed acute vertex for

contacting an underside of the material to be cut to minimize direct impingement of the oxidation stream upon said tip means and to direct molten material, from a kerf in the material to be cut, away from said tip means, and



said tip means being constructed of material with a thermal conductivity greater than the thermal conductivity of said stanchion means and having a mass substantially greater than the mass of said portion of said longitudinally extending stanchion means to distribute and dissipate within said tip means hot spots generated upon said tip means by the oxidation cutter.

3,944,204

RADIOLOGICAL EXAMINATION TABLE

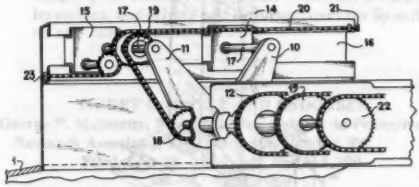
Jean Cesar, Milan, Italy, assignor to C.G.R. Generay S.p.A., Milan, Italy

Filed May 24, 1974, Ser. No. 473,063

Claims priority, application France, May 29, 1973, 73.19497

Int. Cl.[2] A61G *13/00*

U.S. Cl. 269—323 **3 Claims**



1. In a radiological examination table including a patient-supporting platform having a first and a second end, a supporting mechanism for respectively supporting both said ends of said platform and for imparting thereto translational displacements, on the one hand, parallel to the transverse axis of and, on the other hand, perpendicular to the plane of said platform and rotational displacements about an axis parallel to the longitudinal axis of said platform; said supporting mechanism including a first and a second mechanism identical with each other and respectively connected to said first and second ends of said platform; each of said first and second mechanisms comprising in combination:

a slide fixed to said platform and parallel to the transverse axis thereof;

a first and a second carriage glidably mounted in said slide for displacements therealong;

a first and second pivot respectively journalled to said first and second carriages for providing two axes of rotation parallel to the longitudinal axis of said platform;

a first and a second crank having two ends and respectively carrying at one of their ends said first and second pivots, the other ends of said first and second cranks being respectively secured to a first and a second hollow shaft coaxial with each other, one of said two hollow shafts being inserted within the other one and both being independently rotatable relative to each other;

a third shaft coaxial with the common axis of said two hollow shafts and mounted independently rotatably therewithin;

a drive means, coupled to one end of said third shaft and rotatably mounted on one of said pivots, for driving a geared wheel engaging with a stationary structure substantially parallel and fixedly mounted relatively to said slide, wherein said geared wheel, when rotated, controls the displacement of said slide relative to said carriage.

3,944,205

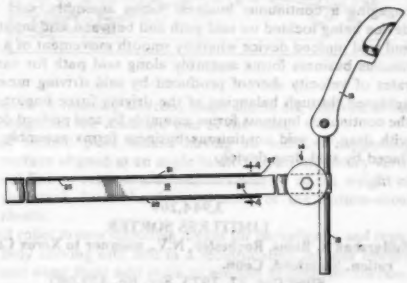
ADJUSTING MECHANISM FOR STIRRUP EXTENSION BAR FOR MEDICAL EXAMINATION TABLE

Floyd F. Mueller, Two Rivers, Wis., assignor to American Hospital Supply Corporation, Evanston, Ill.

Continuation-in-part of Ser. No. 329,380, Feb. 5, 1973, abandoned. This application May 20, 1974, Ser. No. 471,474

Int. Cl.[2] B25B *1/14*

U.S. Cl. 269—328 **4 Claims**



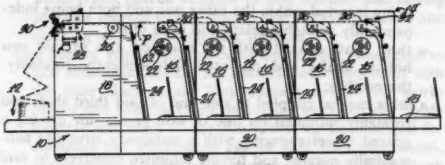
1. In an examination table having first and second foot rest assemblies located respectively at the left and right sides of the foot end of the table, the improvement wherein each of said foot rest assemblies comprises: a horizontal support bar having inner and outer ends; a stirrup assembly carried by the outer end of said bar; a closed tubular channel in said table for telescopically receiving said bar and conforming to the shape of said bar with clearances on all sides; and first and second brake pads of resilient, compressible material located respectively on the upper surface of the inner end of said bar and the lower surface of said channel adjacent the mouth thereof, the material of said channel and said brake pads being such that the coefficient of friction therebetween is at least about 0.9, whereby a downward force on said stirrup assembly will cause said extension bar to frictionally engage said second brake pad and pivot thereabout while said first brake pad frictionally engages the under surface of the top of said channel to lock said bar against further horizontal movement, said frictional engagement between said bar and channel being the sole force locking said bar in place.

3,944,206

DELEAVER FOR CONTINUOUS BUSINESS FORMS

Kenneth W. Bower, Des Plaines, Ill., assignor to Uarco Incorporated, Barrington, Ill.

Filed Sept. 30, 1974, Ser. No. 510,486
Int. Cl.² B65H 41/00
U.S. Cl. 270—52.5 12 Claims



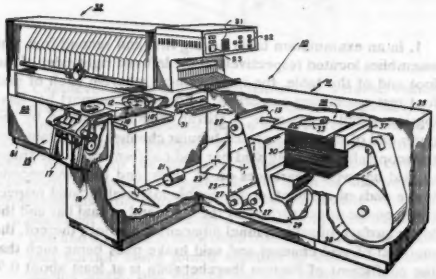
1. In a deleaver for separating the plies of multiple-ply, continuous business forms stationery assemblies, the combination comprising: frame means having an input end for receiving the continuous business forms assembly and an output end for separately receiving individual plies of the continuous business forms assembly and including means defining a path of stationery travel from said input end to said output end; means along said path for engaging the continuous business forms assembly for driving the continuous business forms assembly along said path; a pinfeed device located forwardly of said driving means for cooperating with control punched margins on a continuous business forms assembly, said pinfeed device including means defining a non-positive drive for tending to cause said pinfeed device to drive the continuous business forms assembly along said path at a rate greater than the rate at which said driving means will drive the continuous business forms assembly along said path and a drag device for engaging a continuous business forms assembly, said drag device being located on said path and between said input end and said pinfeed device whereby smooth movement of a continuous business forms assembly along said path for varying rates of velocity thereof produced by said driving means is achieved through balancing of the driving force imparted to the continuous business forms assembly by said pinfeed device with drag on said continuous business forms assembly produced by said drag device.

3,944,207

LIMITLESS SORTER

Sudarshan S. Bains, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 27, 1973, Ser. No. 429,003
Int. Cl.² B65H 39/02
U.S. Cl. 270—58 6 Claims



3. An apparatus for grouping discrete items to form a plurality of completed sets according to a predetermined program comprising:

a first horizontal array of bins,

a second horizontal array of bins disposed under said first set of bins in alignment therewith,

means for inserting the items into said first array of bins according to the predetermined program,

actuable means movable between a retaining position and a releasing position, said means, when in the retaining position, being adapted for retaining the items in said first array of bins while they are being inserted therein,

control means including logic circuitry for monitoring the completion of the sets and generating a completion signal, said actuable means being actuated to said releasing position in response to said completion signal for releasing said sets into said second array of bins to empty said first array of bins, and,

means for preventing said actuable means from releasing the sets in said first array of bins when said second array of bins are not empty.

6. A sheet handling apparatus comprising:

a first horizontal array of bins,

a second horizontal array of bins disposed beneath said first set of bins in alignment therewith,

deflector means for directing sheets into said first array of bins,

actuable means movable between a retaining position and a releasing position, said means, when in the retaining position being adapted for retaining the sheets in said first array of bins,

control means adapted for actuating deflector means for directing sheets into said first array of bins to provide collated sets of sheets therein, said control means further being adapted to actuate said actuable means for moving said actuable means to said releasing position for releasing the completed collated sets into said second array of bins,

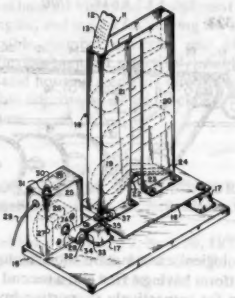
means for edge-aligning the sheets in said second array of bins, said edge-aligning means including means for simultaneously jogging the sheets.

3,944,208

VIBRATING RECEIVING DEVICE FOR FOLDING PUNCH TAPE

Lloyd Naegeli, 1908 Ridgemont Drive, Austin, Tex. 78723

Filed June 20, 1974, Ser. No. 481,165
Int. Cl.² B65H 45/00
U.S. Cl. 270—61 F 5 Claims



1. A vibrating receiving device for continuous folded material comprising:

a. a base means adapted to rest on a flat surface,

b. an oscillating floor mounted above said base means,

c. a multiplicity of resilient mounts supporting said oscillating floor above the said base means,

d. a magazine adapted to receive continuous folded material secured to and projecting upward normal to said oscillating floor, and

e. oscillating means attached to said oscillating floor said oscillating means further comprising:

1. an eccentric drive means securely retained relative to said base,

2. an arm oscillator attachment securely affixed to said oscillating floor,

3. an agitator arm interconnecting said eccentric drive means and said oscillator arm attachment agitating said floor responsive to rotation of said eccentric drive means.

3,944,209

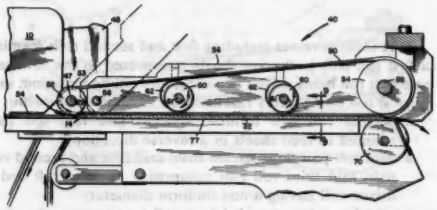
HIGH SPEED DOCUMENT HANDLER

George Fallos, Easton, Pa., assignor to Bell and Howell Company, Phillipsburg, N.J.

Filed Jan. 15, 1974, Ser. No. 433,498

Int. Cl.² B65H *3/06, 3/46, 5/02, 29/20*

U.S. Cl. 271—4 **25 Claims**



3. A document handler comprising:

a document stack hopper means defining a hopper-plate surface for supporting documents in said hopper and further including a lipped contour plate defining a lip surface adjacent to said hopper-plate surface but rising with substantial abruptness from said hopper-plate surface, to form a barrier surface which documents fed from said hopper-plate surface must climb, said lip surface forming a fillet or concave junction with said hopper-plate surface; and

feed means situated adjacent said contour plate at said lip surface for engaging a document from a stack on said hopper-plate surface; driving said document toward said lip surface; and driving said document over the lip surface on said contour plate.

3,944,210

TICKET COUNTER AND ENDORSER

George P. McInerny, Andalusia, Pa., assignor to Pennsylvania Research Associates, Inc., Cornwells Heights, Pa.

Filed Apr. 30, 1974, Ser. No. 465,700

Int. Cl.² B65H *3/04*

U.S. Cl. 271—4 **19 Claims**

1. Apparatus for feeding sheets arranged in a stack in a predetermined direction, which sheets are intermixed in said stack and may be of different sizes, shapes, thickness, finishes and quality of condition, said apparatus comprising an infeed hopper;

said hopper including first and second stationary plate means for supporting said stack;

said first plate means engaging the first sheet to be fed from said stack and said second plate means engaging the leading edges of at least some of the sheets in said stack, wherein the leading edges of said sheets are those edges which first pass out of said hopper when moving in said predetermined direction;

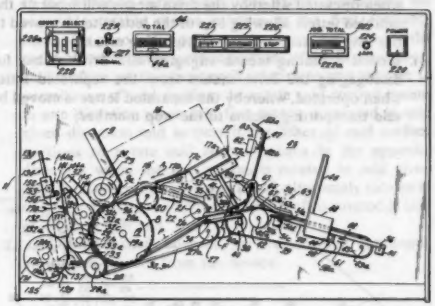
a closed loop feed belt and roller means for supporting said belt so that a portion thereof extends between the downstream end of said plate and the lower end of said second plate and is positioned beneath said stack;

means driving one of said roller means for moving said belt so that said portion moves toward the lower edge of said second plate;

the downstream end of said belt portion and the lower edge of said second plate defining an outfeed opening for said hopper;

said first plate means having a first surface portion whose downstream end lies adjacent said outfeed opening and whose upstream end is remote from said outfeed opening, and a second inclined surface portion having a downstream end joined to the upstream end of said first surface portion with the junction defining an angle of greater than 90°, and an upstream end remote from said first surface portion wherein the upstream end of said second surface portion remote from said junction lies a spaced distance from the plate of said first surface portion;

the upstream end of said first plate means second surface portion engaging the trailing edges of the sheets near the bottom of said stack as the sheets are fed through the



outfeed opening whereby these sheets are relieved of the weight of the rearward end of the stack;

said second plate means having an inclined supporting surface aligned at an angle relative to an imaginary vertical line to remove a substantial portion of the weight of the stack from the forward ends of the bottom-most sheets;

said roller means including means for periodically and regularly moving said belt in a reciprocating manner toward and away from said stack to initially engage the intermediate portion of the bottom document and simultaneously jog the documents in the stack to facilitate movement of the documents for simultaneously moving the trailing edges of documents downstream along said first and second surface portions and away from the remainder of said stack so as to remove the rearward weight of said stack from said sheet engaging the first plate means to facilitate movement of said sheet through said outfeed passageway.

3,944,211

LETTER FEEDER

Donald C. Rasmussen, Barrington, Ill., and Richard L. Funkhouser, St. Petersburg, Fla., assignors to NCR Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 410,107, Oct. 26, 1973, abandoned. This application Feb. 27, 1975, Ser. No. 553,853

Int. Cl.² B65H *5/02*

U.S. Cl. 271—8 R **6 Claims**

1. An apparatus for separating and feeding doubled letters to an operating station comprising

a. means for transporting doubled letters in a straight line stream;

b. support means movably mounted adjacent the stream of doubled letters;

c. first urging means engaging said support means for normally urging said support means to engage the doubled letters in the stream;

d. a drive means rotating in a direction opposite to the direction of movement of the doubled letters and mounted for movement adjacent the stream of doubled letters;

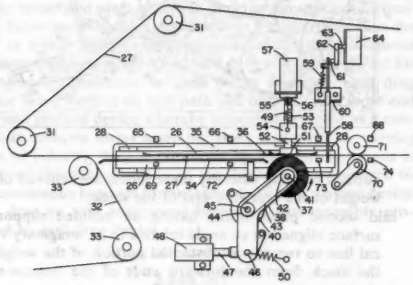
e. second urging means engaging said drive means for normally urging said drive means to a position to engage said support means to block the movement of the doubled letters in the stream;

f. a movable stop member slidably mounted adjacent the stream of letters for movement between a blocking and non-blocking position with the letters in said stream when operated;

g. third urging means engaging said stop member for normally urging said stop means into a blocking position with the letters in said stream;

h. first actuating means engaging said support means for disengaging the support means from the drive means when operated whereby the drive means will separate the doubled letters allowing one of the letters to be moved to the stop member by said transporting means;

i. second actuating means engaging said drive means for disengaging the drive means from the separated letter when operated, whereby the separated letter is moved by said transporting means to the stop member;



j. third actuating means engaging said stop member for moving said stop member to a non-blocking position when operated whereby the letters blocked by stop members are moved to the operating station by said transporting means;

k. and sensing means positioned adjacent the stream of letters and operatively connected to said first, second and third actuating means, said sensing means operating said actuating means upon sensing letters in said stream whereby doubled letters are separated by said drive means and moved separately to the operating station by said transporting means.

5. A method for separating and feeding doubled letters to a following station comprising

a. transporting a plurality of letters in a straight line stream;

b. stopping the letters;

c. moving a brush member, rotating in a direction opposite to the movement of the letters, into engagement with the stopped letters to move a doubled letter upstream of said brush member;

d. transporting the other letter to the following station and the doubled letter back toward the brush member;

e. moving a support member into engagement with the rotating brush member to stop the doubled letter;

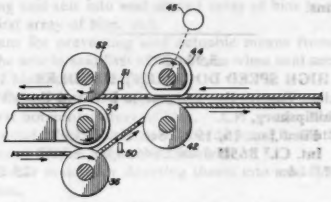
f. and removing the support and brush members from engagement with the doubled letter to release the letter for movement to the following station.

3,944,212

SHEET REVERSING MECHANISM

Klaus K. Stange, Pittsford, and Erwin J. Strobel, Jr., Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 25, 1974, Ser. No. 526,650
Int. Cl.² B65H *29/60*
U.S. Cl. 271—9 **5 Claims**



1. A sheet reverser including first and second rolls forming a first roll pair to receive sheets transported to the reverser, said first roll being driven in a sheet forwarding direction, said second roll being freely rotatable for co-action therewith;

a second roll pair formed adjacent said first roll pair adapted to feed sheets in a reverse direction;

a third roll pair downstream from said first and second roll pair, said third roll pair comprising an idler roll and a driven roll having a non-uniform diameter;

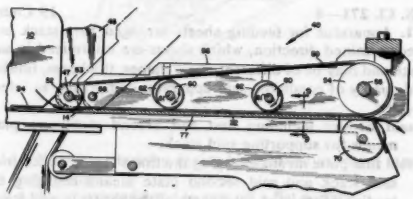
means for rotating said driven roll in a reverse direction through one revolution when actuated, actuation of said driven roll when a sheet is disposed between said third roll pair causing said driven roll to pinch the sheet between said driven roll and said idler roll during a portion of the revolution of said driven roll, said driven roll being spaced from said idler roll when said drive means is inactivated to allow a sheet fed by said first roll pair into the space between said third roll pair to pass unimpeded therebetween until said drive means is actuated, actuation of said drive means causing said third roll pair to contact the sheet passing therebetween and drive the sheet in the reverse direction into the rolls of said second roll pair to feed the sheet in the reverse direction.

3,944,213

HIGH SPEED DOCUMENT HANDLER

George Fallos, Easton, and Wilbur J. Morrison, Nazareth, both of Pa., assignors to Bell and Howell, Phillipsburg, N.J.

Filed Jan. 15, 1974, Ser. No. 433,487
Int. Cl.² B65H *3/06, 3/46, 5/02*
U.S. Cl. 271—10 **7 Claims**



1. A document feeder comprising:

a document stack hopper having a base surface for supporting a stack of documents in said hopper;

a lipped contour plate located adjacent said base surface for forming a lip surface adjacent to said base surface, rising from said base surface in a substantially abrupt manner

but including a fillet portion for forming a smooth transition from said base surface; and

a feed roll located above said base surface adjacent said lip surface and adapted to engage the foremost document of said stack supported by the base surface of said hopper and to drive said foremost document toward said lip surface;

wherein said filled portion or concave junction of said lip surface with said base surface has a transition radius which is about one quarter of the radius of said feed roll.

3,944,214

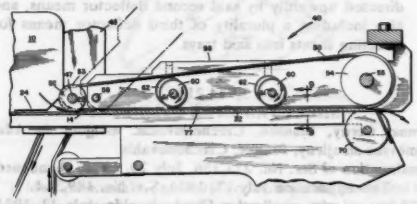
HIGH SPEED DOCUMENT HANDLER

George Fallos, and James E. Kissawetter, both of Easton, Pa., assignors to Bell and Howell Company, Phillipsburg, N.J.

Filed Jan. 15, 1974, Ser. No. 433,500

Int. Cl.² B65H *3/06, 3/46, 5/02*

U.S. Cl. 271—10 **6 Claims**



1. A document feeder comprising:

a document hopper means including a base plate surface adapted to support documents located thereon;

a lipped contour plate for defining a lip surface adjacent said base plate surface, said lip surface rising substantially abruptly from said base plate surface and thereby forming a barrier which is relatively difficult for documents being fed from said base plate surface to move upwardly and over and which has a fillet or concave juncture surface portion to form a smooth transition with the base plate surface;

a feed roller located above said base plate surface adjacent said lip surface;

said feed roller being spaced from said base plate surface by a distance at least greater than one but not more than 10 times the thickness of said documents.

3,944,215

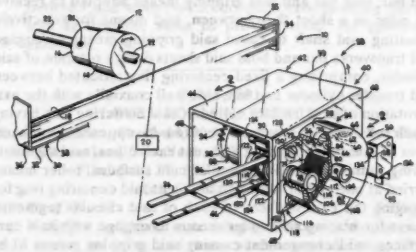
SHEET FEEDING APPARATUS

Christian A. Beck, Ridgefield, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Nov. 18, 1974, Ser. No. 524,455

Int. Cl.² B65H *3/06*

U.S. Cl. 271—22 **7 Claims**



1. Sheet feeding apparatus including a modularly constructed input-output device comprising:

a. a rigid mounting frame;

b. first rotatable means having a first axis of rotation, the first means including an input shaft and a first member attached thereto, the input shaft rotatably attached to the frame, the first member including an outer wall and a hub, the outer wall having an inwardly facing surface portion, the hub having an outwardly facing surface portion, the surface portions defining opposed circularly-extending paths of travel when the first means is rotated;

c. clutch means mounted on the input shaft, said clutch means adapted to be driven from a source of supply of rotational movement, said clutch means being energizeable in response to a sheet feeding demand signal for imparting the rotational movement to the input shaft for rotation of the input shaft and thus the first means in a given direction;

d. second rotatable means having a second axis of rotation, the second means including an output shaft and a second member attached thereto, means for rotatably supporting the output shaft, said supporting means movably attached to the frame to permit adjustably fixedly positioning the second rotatable means relative to the first rotatable means for proper disposition of the second member in the paths of travel of the surface portions of the first member;

e. said surface portions arranged relative to one another to permit one of said portions to rotate said second means in one direction when said first means is rotated in said given direction and to permit the other of said surface portions to rotate said second means in the opposite direction when the first means is rotated in said given direction, whereby said output shaft alternately rotates in opposite directions when said input shaft is rotated in said given direction and

f. said output shaft adapted for transmitting rotational movement thereof from the device.

3,944,216

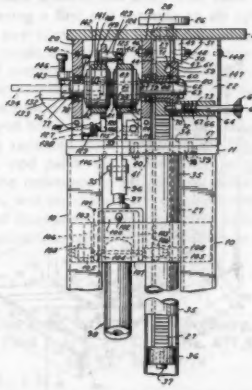
TOP STACK FEEDER

Richard G. Hollinger, 10745 Kingston, Huntington Woods, Mich. 48070

Filed Oct. 21, 1974, Ser. No. 516,400

Int. Cl.² B65H *1/14*

U.S. Cl. 271—157 **8 Claims**



4. In a workpiece feeding apparatus for feeding workpieces from the top of a stack of workpieces, the combination comprising:

a. a support frame;

b. means operatively mounted on said support frame for operatively supporting a stack of horizontally disposed workpieces;

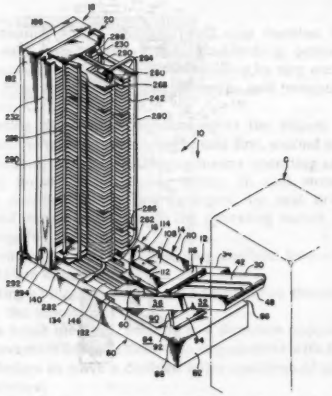
c. lifting means movably mounted on said support frame for moving said stack of workpieces upwardly in a step-by-step manner;
d. clutch means operatively engaged with said lifting means for operating said lifting means upwardly in said step-by-step manner;
e. power means operatively connected to said clutch means for operating the clutch means to move said lifting means upwardly in said step-by-step manner;
f. said lifting means including,
1. a vertically disposed gear rack having a lifting plate mounted on the upper end thereof for engagement with the lower end of said stack of workpieces,
2. means for movably mounting said gear rack on said support frame,
3. a horizontally disposed shaft rotatably mounted on said support frame,
4. a gear rotatably mounted on said shaft and engaged with said gear rack, and,
5. means for detachably connecting said gear to said shaft;
g. said clutch means including:
1. a first clutch member operatively mounted on said horizontally disposed shaft and being operated by said power means and in driving engagement with said shaft for driving said shaft in one direction to turn said gear and move said gear rack upwardly through a predetermined upward feeding movement, and being overriding relative to said shaft during a gravity operated succeeding gear rack retracting movement; and,
2. a second clutch member operatively mounted on said horizontally disposed shaft and being overriding relative to said shaft during said upward feeding movement, and being in braking engagement with said shaft during said retracting movement.

3,944,217

TOWER TYPE SORTING AND COLLATING APPARATUS

Ronald W. Greene, Seattle; Edmund I. Fagan, Bellevue, and Jack D. Keeler, Seattle, all of Wash., assignors to EMF Corporation, Seattle, Wash.

Filed Nov. 23, 1973, Ser. No. 418,570
Int. Cl.² B65H *29/58, 31/24*
U.S. Cl. 271—173 **24 Claims**



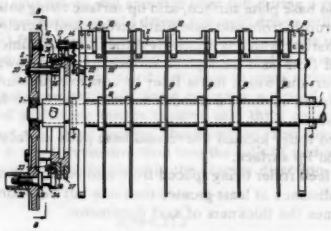
1. Tower type sheet sorting apparatus, comprising:
a. an interface section for accepting sheets from a reproducing machine, said interface section including an interface base portion, an interface conveyor portion on said interface base portion, such that said interface conveyor portion angles generally downwardly from said reproducing machine, proof tray means located over said interface conveyor portion and first deflector means for selectively directing sheets off said interface conveyor portion into said proof tray,
b. a sorter base connected to said interface base portion having a generally horizontally disposed sorter base conveyor means for receiving sheets from the lower end of said interface conveyor portion, said sorter base including a second deflector means for directing sheets upwardly into a sorter tower assembly supported on said sorter base or to allow said sheets to continue on said sorter base conveyor means,
c. a sorter tower assembly on said sorter base and including a tower bin section rigidly supported on said sorter base, said bin section having a vertical array of generally horizontally disposed, spaced apart paper copy receiving trays, and
d. a generally vertically disposed tower conveyor section pivotally supported on said tower bin section for receiving sheets from said sorter base conveyor means when directed upwardly by said second deflector means, and also including a plurality of third deflector means for directing sheets into said trays.

3,944,218

SHEET TRANSFER CYLINDERS

Arnost Cerny, Blansko, Czechoslovakia, assignor to Adamovske strojirny, Prague, Czechoslovakia

Continuation of Ser. No. 273,356, July 20, 1972, abandoned. This application July 17, 1974, Ser. No. 489,364
Claims priority, application Czechoslovakia, July 22, 1971, 5389-71
Int. Cl.² B65H *5/12*
U.S. Cl. 271—277 **4 Claims**



1. A sheet transfer apparatus for a rotary printing machine capable of successive printing selectively on one or both sides of a sheet, comprising a transfer cylinder mounted between the side walls of said machine for rotation about its central axis and being provided adjacent the surface thereof with a fixed transverse bar and with a rotatable shaft spaced therefrom, gripping means secured to said shaft in opposition to said bar, said bar and said gripping means adapted to receive the edge of a sheet therebetween, and means for selectively actuating said shaft to cause said gripping means to engage said transverse bar and hold said sheets during rotation of said cylinder, comprising a fixed centering ring mounted between said transfer cylinder and one side wall coaxially with the axis of rotation of said transfer cylinder, said centering ring having a pair of circular segments secured to opposed peripheral faces of said centering ring adjacent each other, said segments having radially extending circular cam surfaces, roller means carried at one end of said shaft adjacent said centering ring for engaging the cam surfaces of each of said circular segments, means for biasing said roller means to engage with said cam surfaces, said engagement causing said gripping means to be activated into engagement with said transverse bar, the first of said segments being fixed with respect to said centering ring and the second of said segments being circumferentially ad-

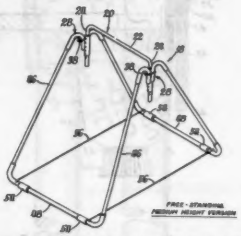
justable with respect to said first of said segments to vary the length of engagement of said rollers with said cams whereby the point at which said grippers are free from engagement with said transverse bar is adjustable relative to the degree of rotation of said transfer cylinder.

3,944,219

MULTIPOSITIONABLE PORTABLE AND COLLAPSIBLE HORIZONTAL BAR EXERCISING APPARATUS

Roy F. LoPresti, Chicago, Ill., assignor to Samuel Peskin, Chicago, Ill.

Filed Apr. 11, 1975, Ser. No. 567,370
Int. Cl.² A63B 1/02
U.S. Cl. 272—62 5 Claims



1. Multipositionable, portable and collapsible horizontal bar exercising apparatus comprising an open frame consisting of:

a U-shaped tubular exercising cross bar having a horizontal center section extending from side to side of said frame, and having vertical end sections for supporting said center section;

a spider support member at each side of said frame, each spider support member having a vertical tube with a corresponding vertical end section of said tubular cross bar telescopically and detachable coupled thereto, each spider support member further having integral therewith a pair of downwardly diverging tubes;

a pair of downwardly diverging tubular legs telescopically and detachably coupled to said pair of downwardly diverging tubes on the spider support member at each side of said frame;

a pair of U-shaped tubular feet at the front and back of said frame, each of said feet having a horizontal center section for providing floor support and extending from side to side of said frame, and having upstanding end sections telescopically and detachably coupled to the bottom ends of said legs; and

at least one tension member extending from front to back of said frame and connected respectively between said feet to prevent said feet from moving apart and spreading said legs by downward load applied to said cross bar;

said frame providing a clear vertical space between said cross bar at the top and said feet at the bottom, and between said spider members and corresponding pairs of legs at opposite sides to provide room for gymnastic exercises.

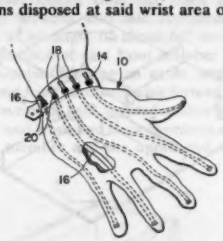
3,944,220

GLOVE AND HAND EXERCISER

Thomas Fasano, Freehold, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Feb. 27, 1975, Ser. No. 553,741
Int. Cl.² A63B 5/00
U.S. Cl. 272—67 5 Claims

1. A finger and hand exercising glove comprising a glove body having an inner and outer surface and defining finger stalls, and a wrist area, elastic tension straps disposed on said glove, each of said straps communicating between a single finger stall and a wrist area of said glove, each strap operative to move independent of said other straps, said straps each having two end portions, a first end portion being fixedly engaged by a portion of said finger stall, a second end being free, holding means disposed at said wrist area of said glove,



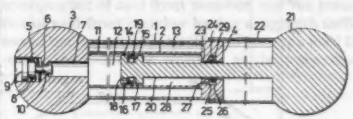
said holding means being adapted to slidably engage said free end of each of said straps, each of said straps being operative to slide inwardly and outwardly in said holding means whereby movement of each of said straps exerts independent restraint upon a single finger stall.

3,944,221

RESISTANCE DEVICE FOR A GYMNASTICS APPARATUS

Karl-Erik Berkestad, Skattegarden 34, S-582 41 Linkoping, and Lars Göran Torgny Börjesson, Ravinvagen 17, S-595 00 Mjolby, both of Sweden

Filed Mar. 11, 1974, Ser. No. 450,181
Claims priority, application Sweden, Mar. 12, 1973, 7303385
Int. Cl.² A63B 21/00
U.S. Cl. 272—79 C 9 Claims



1. A gymnastics apparatus having a resistive device, said device comprising first and second end parts which are reciprocally movable towards and away from each other, said first end part having a first end forming an air cylinder and said second end part comprising a first end forming a piston which is movable inside said air cylinder, and a second end forming a piston rod connected to said first end, characterized in that the device is provided with a first non-return valve arranged between said piston and said cylinder and a second non-return valve arranged between said cylinder and said piston rod such that, during repeated relative movement between said first and second end parts, the air pressure in the device, and therewith, the resistance to said relative movement increases successively, and an evacuation valve provided in said first end part and in communication with said cylinder and being manually operable to reduce the air pressure in said cylinder.

3,944,222

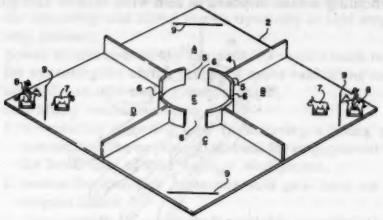
GAME

George E. Van Horn, P.O. Box 65, Ehrenberg, Ariz. 85334

Filed June 6, 1974, Ser. No. 477,550
Int. Cl.² A63F 9/14
U.S. Cl. 273—1 M 1 Claim

1. A game comprising a playing surface having an upward fence-like projection dividing the playing surface into a plurality of starting spaces and a finishing space with an opening from each starting space to the finishing space, each starting space being bounded laterally by radial elements of the upward fence-like projection and the opening from each starting space to the finishing space being of less width than the dis-

tance between the inner ends of the radial elements of the upward fence-like projection bounding laterally the starting space, and game pieces containing magnets all disposed above



the playing surface so that a player manipulating one game piece may attempt to propel by magnetic force another game piece through one of said openings.

3,944,223

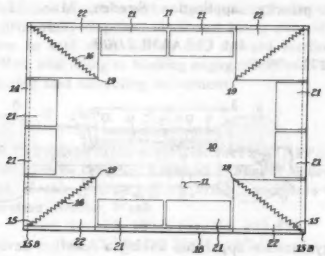
HOCKEY GAME APPARATUS

John J. Bromwell, Springtown, Pa., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Jan. 14, 1975, Ser. No. 541,006

Int. Cl.² A63B *69/00*

U.S. Cl. 273—1 B **2 Claims**



1. A hockey puck of official and conventional size and shape and a hockey type goal structure formed of a substantially rectangular sheet of flexible material supported by springs to a substantially rectangular frame structure so that said sheet lies at an angle to a horizontal plane upon which the frame rests, said sheet being provided with through openings along its periphery, said openings being of a size to permit passage of the hockey puck therethrough.

3,944,224

POCKET ASSEMBLY FOR A POOL TABLE

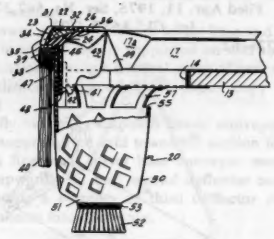
Michael J. Lalick, 3700 W. 97th St., Evergreen Park, Ill. 60642

Filed Nov. 11, 1974, Ser. No. 522,707

Int. Cl.² A63D *15/00*

U.S. Cl. 273—12 **8 Claims**

1. A pocket assembly for a pool table comprising a pocket and a pocket support structure mountable in a gap between the ends of rails of a pool table to support the pocket beneath the gap and adjacent a cut-out portion of a bed of a table, said support structure including a pocket iron having a body portion with a pair of spaced ends, each end having a mounting projection extending therefrom; and a synthetic cover integrally molded on the body portion with the projections extending therethrough, said cover having an upper surface extending between said pair of ends to provide a surface across the gap, an outer curved surface extending between said pair of ends and extending downward from the upper surface, an inner curved surface slanting downward and outwardly from the upper surface to deflect a ball downward, and a bottom surface interconnecting the inner and outer curved surfaces, said cover including an integral outer curved flange extending downwardly from the bottom surface adjacent the outer surface and having substantially the same curved configuration as the outer surface, and an integral, downwardly extending shield having a center portion and a pair of end portions, said center portion having a curvature approxi-



mately the same as the curvature of the flange and extending from a curved line adjacent to a merger between the inner and the bottom surfaces and equally spaced from the flange to provide a curved recess between the center portion and flange for receiving a portion of the pocket, each of said end portions of the shield extending inwardly from the center portion along the end of the cover, said pocket being joined to the cover by having portions inserted into the curved recess and attached to said flange.

3,944,225

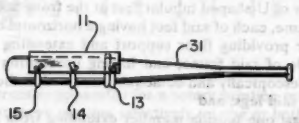
BASEBALL BAT BATTING PRACTICE SLEEVE

Daniel F. Greaney, 10 Chesbrough Road, West Roxbury, Mass. 02134

Filed Sept. 23, 1974, Ser. No. 502,456

Int. Cl.² A63B *69/40*

U.S. Cl. 273—26 B **3 Claims**



1. An improved practice sleeve in combination with a conventional baseball bat comprising,

a strip of yieldable plastic having two concentric slots running the entire length of the strip, said slots having a preselected debth and separated approximate ½ inch apart (a preselected distance centrally located) whereby the strip can be bent about the slots forming a three sided substantially V-shaped trough, the area between said slots defined by said ½ inch separation being a blunted tip of said sleeve; and

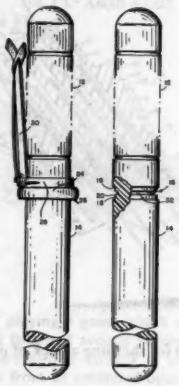
a plurality of shock cords, each of said cords being transversely attached across the trough opening of said sleeve at a point therealong for removably securing said sleeve to said bat, a portion of the large end of said bat being enclosed between the walls and shock cords; one of said shock cords having one of its ends permanently affixed to said sleeve and its other end being extended around said bat before being removably attached to said sleeve at a point remote from said one affixed end.

3,944,226

POLICE CLUB

Paul D. Starrett, Rindge, N.H., assignor to Monadnock Lifetime Products, Inc., Fitzwilliam, N.H.

Filed Nov. 21, 1973, Ser. No. 418,032
Int. Cl.² F41B 15/02
U.S. Cl. 273—84 1 Claim



1. A combination of a police club, abutment ring and carrying thong, wherein the club comprises an elongate stick of extruded high impact polymer having a uniformly continuous circular cross section with a hand grip portion at one end, said stick having at the base of the hang grip portion annular grooves of two widths and two diameters, the first groove being axially wider than the second and the second groove radially deeper than the first and arranged symmetrically at the bottom of the first, said first and second grooves having a flat bottom wall and parallel radially extending side walls, said abutment ring being comprised of high impact elastically extendable polymer mounted on the club in engagement with the grooves, said ring having portions of lesser and greater diameter than the diameter of the stick, said portion of lesser diameter being of a width, depth and of a corresponding configuration to fit into said first groove and having an inwardly extending rib of a width, depth and of a corresponding configuration to fit into said second groove, said portions of lesser diameter and rib locking the ring to the club against movement longitudinally thereon at the base of the handle and said part of greater diameter projecting from the surface of the stick and having right angularly disposed flat annular circular surfaces providing radially extending shoulders and said thong being mounted to the club at the base of the handle portion at the proximal side of the ring with respect to the handle portion and embodying an annular loop constricted about the club at the base of the handle with an edge in engagement with the shoulder at that side and being of lesser thickness than the radial width of the shoulder.

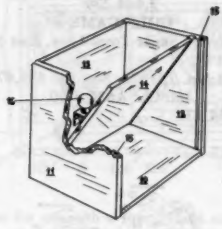
3,944,227

SHOOTING TARGET WITH ILLUMINATING BULB

Thomas Nilsson, Angered, Sweden, assignor to Stiga AB, Tranas, Sweden

Filed Aug. 23, 1974, Ser. No. 500,002
Int. Cl.² A63B 63/00
U.S. Cl. 273—102.4 3 Claims

1. A shooting target for use with air rifles or other short distance weapons comprising a box like structure which comprises a bottom member having a front edge and a back edge and a pair of spaced side edges extending between the front and back edges, a back member extending upwardly from the back edge of said bottom member, a pair of side members each extending upwardly from one of the side edges of said bottom member and a front member extending upwardly from said bottom member spaced from said back member and extending laterally between said side members, said front member disposed at an angle of about 60° to said bottom member with the surface of said front member facing away from said back member forming an acute angle with said bottom member, said front member being formed of a translucent material, a source of light located within said box like structure between said front and back members and intermediate said bottom member and the upper end of said front



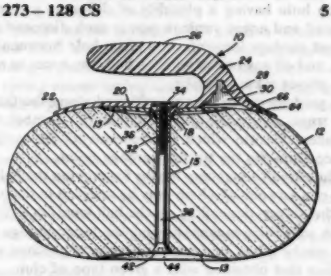
member, means for holding a target in alignment with said front and back members and located on the opposite side of said front member from said back member so that the light from said source of light passes through said front member and is directed on the surface of the target facing said front member while projectiles passing through the target strike said front member and are directed toward said bottom member by the sloping arrangement of said front member, and the translucent material of said front member having a strength sufficient to withstand the impact of projectiles of the type used in air rifles or other short distance weapons as the projectiles pass through the target.

3,944,228

CURLING STONE WASHER AND HANDLE ASSEMBLY

Herbert O. Olson, Edmonton, Canada, assignor to 2001 Plastics, Ltd., Edmonton, Canada

Filed Aug. 20, 1974, Ser. No. 499,021
Int. Cl.² A63B 71/00
U.S. Cl. 273—128 CS 5 Claims



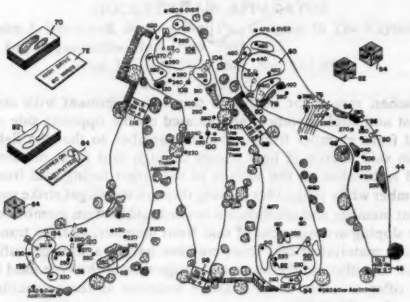
1. In combination, a curling stone having a center hole and a shallow cup-shaped recess in the upper and lower surfaces thereof, and a handle therefor comprising a generally circular plate having a downwardly curved peripheral edge and a gooseneck handle extending upwardly from an edge portion thereof, said plate closely conforming with and engaging the upper surface of the stone, rotatable fastening means connected with the central portion of the plate and extending into the center hole of the stone, and a washer of resilient material having a central bore interposed between the plate and the cup-shaped recess in the stone for frictionally engaging the

stone and plate when compressed by actuating the fastening means while maintaining the handle non-rotative in relation to the stone, said washer being disposed solely in the cup-shaped recess in the stone and including compressible rib means thereon for resisting relative rotation between the stone and plate, said rib means including a plurality of ribs extending radially from said bore on only one side of the washer, said ribs having one flat side surface and a convexly curved opposite side surface for folding when the washer is compressed whereby the folded and compressed ribs will prevent rotation between the washer and curling stone.

3,944,229
GOLF GAME

Thomas E. Feeney, 34 Sugar Toms Lane, East Norwich, Long Island, N.Y. 11732

Filed Jan. 7, 1975, Ser. No. 539,079
Int. Cl.² A63F 3/00
U.S. Cl. 273—134 AE **6 Claims**



1. A golf board game apparatus, comprising:

a. a game board having a complete golf course showing the features and layout of each hole including terrain, natural hazards, tee, pin, disposition and shape of fairway and green traps, and shape of the green, as such would appear on a conventional golf course,

b. each hole having a plurality of different incrementally spaced and noted yardage points each disposed at a different yardage location on a given hole between tee and pin, and on any one of which a ball may come to rest after the player takes a stroke,

c. the yardage points being positioned along the fairway, in the traps, and on the green and having a number disposed adjacent thereto which corresponds to the yardage distance from the tee to that yardage point,

d. a plurality of advancing means for moving the ball toward the pin, any one of which may be selected in the judgment of the player, depending on the ball location at that time, each advancing means showing the total yardage value of the stroke taken, and having a range of yardage values to reflect that obtained with a given type of club,

e. each advancing means providing a combination of numbers covering a different range of values and where the more typical values in the range for the given club are likely to occur, and at least three yardage values have different probabilities of occurrence,

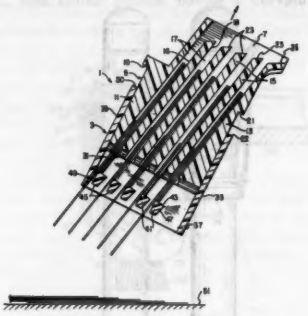
f. a set of at least ten chance cards associated with the fairway traps for giving the result of the player's shot from the traps,

g. a set of at least ten chance cards associated with the green traps for giving the results of the player's stroke from the trap with respect to movement of the ball towards the green and possible holing out.

3,944,230
CARD SHUFFLER

Sol Fineman, 440 Windsor S., Century Village, West Palm Beach, Fla. 33409

Filed June 23, 1975, Ser. No. 589,407
Int. Cl.² A63F 1/12
U.S. Cl. 273—149 R **11 Claims**



10. An apparatus for shuffling a deck of playing cards comprising:

an outer case;

an inner case slidably disposed in said outer case;

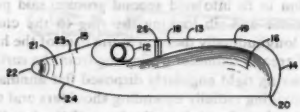
a plurality of separators in said inner case dividing said inner case into a series of compartments having front and back surfaces, said separators lying at an acute angle to the direction said inner case slides in said outer case;

means for preventing the cards from falling out the bottom of said compartments when said inner case is fully inserted in said outer case and permitting said cards to fall out of said compartments, one card substantially simultaneously falling from each of said compartments, as said inner case is slid out of said outer case.

3,944,231
GOLF CLUB

Harold T. Johnson, 706 Pleasant St., Kewanee, Ill. 61443

Filed Mar. 3, 1975, Ser. No. 554,794
Int. Cl.² A63B 53/04
U.S. Cl. 273—162 E **7 Claims**



1. A golf club head having top and bottom sides and having a vertical shaft opening in said top side for receiving the end of a golf club shaft and extending lengthwise between a toe end and a heel end on opposite sides of the opening; a front generally vertically disposed surface that normally strikes a ball and extends upwardly from said bottom side, a rear surface opposite to the front surface having a ball-receiving cavity therein, said cavity being defined by an arcuate shaped rearwardly and upwardly opening surface that in a vertical direction extends from a rear edge of said bottom side to said top side, and in a lengthwise direction extends from said toe end rearwardly to the area of said shaft opening; and said heel end having converging side surfaces and an upwardly facing concave arcuate pole-engaging surface that begins adjacent the shaft opening and extends first downwardly and then outwardly to a relatively small tip at its distal end, the heel end further having an underside that extends lengthwise and

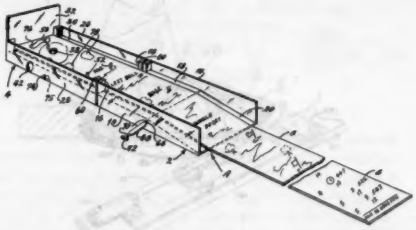
downwardly from the tip to said bottom side so that said heel end may be shoved under a flagpole laying on the ground.

3,944,232

GOLF GAME

David P. Tierney, 1024 Forestwood Drive, Ferguson, Mo. 63135

Filed Dec. 16, 1974, Ser. No. 532,900
Int. Cl.² A63B 67/02
U.S. Cl. 273—176 FB 13 Claims



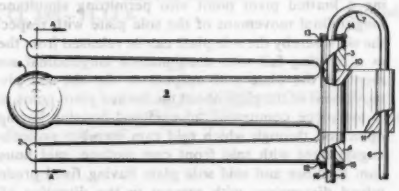
1. A device for playing a game which simulates golf, said device comprising first and second sections of substantially equal size which are hinged directly to each other and fold about a hinge axis from an extended open position, wherein both sections are on the floor, to a compact closed position, wherein one section is against the other section, the sections having supporting surfaces which are located below the hinge axis and align when the sections are open, and face each other, yet are spaced a substantial distance apart, when the sections are closed, the first section further having an open end and the supporting surface of that section being substantially at floor level at the open end; and a mat which is substantially longer than the combined lengths of the supporting surfaces, the mat being adapted to rest on the supporting surfaces when the sections are open, the mat being flexible so that it may be folded up upon itself and contained wholly within the space between the supporting surfaces of the sections when the sections are in their closed position.

3,944,233

GOLF CLUB SWING TRAINING DEVICE

Roland J. Colton, 41 Vista Way, Port Washington, N.Y. 11050

Filed Jan. 29, 1975, Ser. No. 545,099
Int. Cl.² A63B 69/36
U.S. Cl. 273—186 R 4 Claims



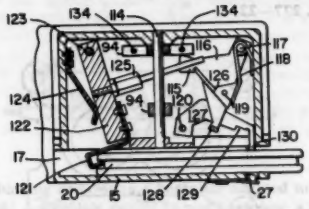
1. A golf training device comprising a U-shaped support, a pair of elongated arms of substantially the same length pivotally mounted on one of the legs of said support, said arms being spaced from each other along said leg; a target carrier non-rotatably mounted on said support and between said elongated arms and having a target on the end thereof remote from said support, said target being positioned between said arms so that a golf club improperly swung will contact one of said arms and when properly swung will contact only said target, means for preventing the return of an arm to its original position after it has been struck and caused to pivot on said one leg.

3,944,234

AUDIO APPARATUS

Jiri M. Nessel, Palo Alto, Calif., assignor to Victor Richards, San Francisco, Calif.

Division of Ser. No. 421,986, Dec. 5, 1973. This application Nov. 21, 1974, Ser. No. 525,776
Int. Cl.² G11B 3/62, 25/04
U.S. Cl. 274—9 B 3 Claims



1. Apparatus for use with a sound track unit comprising a generally planar frame containing a tubular body mounted for rotation about its tubular axis within said frame and with said axis of said tubular body perpendicular to the plane of said generally planar frame by means of covers having apertures therein surrounding opposite ends of said tubular body, said apparatus comprising:

a. a rigid receptacle for receiving and locating said sound track unit with said frame in a given plane and with said axis of said tubular body coincident with a given axis;

b. an elongated shaft mounted with respect to said rigid receptacle with its axis of elongation extending away from said receptacle in spaced parallel relation to said given axis and with one end thereof adjacent said receptacle;

c. a slide member mounted on said shaft for movement along said shaft from a first position adjacent said receptacle to a second position spaced from said receptacle;

d. drive means comprising a solid body having an exterior surface dimensioned to mate with the interior surface of said tubular member mounted on said slide member for rotation about said given axis, said solid body penetrating said receptacle in said first position of said slide member and being spaced from said receptacle in said second position of said slide member;

e. first pivot means mounted for rotation about an axis spaced from and perpendicular to said given axis and including a pawl engaging said slide member;

f. first spring means urging said first pivot member to rotate through a given arc away from said receptacle and move said slide member from said first position to said second position thereof;

g. second pivot means mounted for rotation about an axis perpendicular to said given axis and spaced from both said given axis and said axis of rotation of said first pivot means and including a projection extending into interfering relation with said first pivot means during a portion of the rotational movements thereof through through their respective given arcs;

h. second spring means urging said second pivot means to rotate through a given arc away from said receptacle;

i. key hook means mounted on said second pivot means and extending into said receptacle for engagement by said frame upon insertion thereof into said receptacle to cause said second pivot means to rotate toward said receptacle against the force of said second spring means; said rotation of said second pivot means causing said first pivot means to rotate toward said receptacle against the force of said first spring means through said interfering relation between said first and second pivot means and allowing

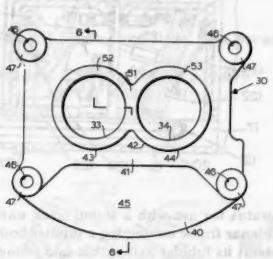
said slide member to move from said second position to said first position thereof and said solid body of said drive means to enter into driving engagement within said tubular body of said sound track unit.

3,944,235

GASKET WITH HEAT INSULATING PROPERTIES

Alexander L. Gordon, Worcester, Mass., assignor to Federal-Mogul Corporation, Southfield, Mich.

Continuation of Ser. No. 358,293, May 8, 1973, abandoned.
This application Jan. 17, 1975, Ser. No. 542,078
Int. Cl.² F02F 11/00
U.S. Cl. 277—22 10 Claims



1. A carburetor mounting gasket for interposition between a carburetor casting and an automobile engine casting, including in combination,

a thick molded rigid core of heat-insulating resin having passage means therethrough, a first flat bearing surface for facing one said casting, an opposite flat non-bearing surface from which projects a portion surrounding said passage means, said portion having a second flat bearing surface for facing the other said casting,

two thin cutout sheets of resilient gasket material, one covering each of said flat bearing surfaces and secured thereto,

said core having rigid cylindrical extensions for surrounding bolts used to secure the carburetor casting to said engine casting,

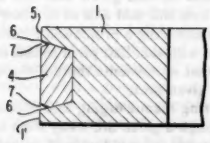
whereby gasket sealing is obtained while the carburetor is also insulated from the heat of said engine casting.

3,944,236

PISTON RING

Tsutomu Takao, Tokyo, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed June 27, 1975, Ser. No. 590,997
Claims priority, application Japan, July 5, 1974, 49-76433
Int. Cl.² F16J 9/20
U.S. Cl. 277—224 3 Claims



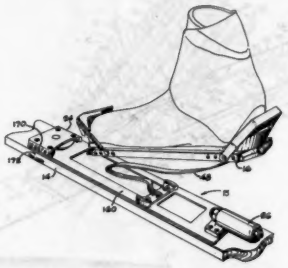
1. In a piston ring whose piston ring sliding surface is provided with a channel having a chrome plating layer therein, the improvement comprising, the piston ring with said chrome layer having an upper groove and lower groove at the borders of said chrome layer and, the land portions of said piston ring sliding surface and the ridgelines of said chrome layer forming an obtuse angle at each side thereof.

3,944,237

SKI BINDING

Walter Dorwin Teague, Jr., Nyack, N.Y., assignor to James Reed Morris, IV; Mary Carroll Sinclaire Morris; Halsted Morris and Katrina Morris, all of Denver, Colo., part interest to each

Filed Mar. 25, 1974, Ser. No. 454,719
Int. Cl.² A63C 9/08
U.S. Cl. 280—11.35 K 39 Claims



1. A ski binding comprising a rigid sole plate including means for releasably securing the sole plate to the sole of a boot; said sole plate having front and rear cam surfaces thereon;

a toe piece member adapted to be mounted on a ski in a predetermined position and including means defining a movable cam surface for engaging said front cam surface of the sole plate to releasably hold said plate on the ski; and a heel plate adapted to be mounted on said ski in a fixed position adjacent the rear cam surface of the sole plate when the sole plate is engaged with said toe piece and including resiliently biased cam means for engaging said rear cam surface of the sole plate and for biasing said sole plate towards said toe piece thereby to normally maintain said front cam surface of the sole plate in engagement with said toe piece; said means defining a movable cam surface in said toe piece comprising a cam member rotatably mounted in said toe piece and adapted to rotate upon lateral movement of the sole plate with respect to the toe piece, thereby to reduce resistance to binding release in the lateral direction; and

means adapted to be mounted on the ski between the toe and heel pieces for cooperating with said sole plate to define a limited pivot point for the sole plate with respect to the ski during release of the binding, said means defining a limited pivot point also permitting simultaneous longitudinal movement of the sole plate with respect to the ski whereby the sole plate can be released from the ski in a twisting fall with simultaneous longitudinal movement of the plate with respect to the ski and pivotal movement of the plate about the limited pivot point; and

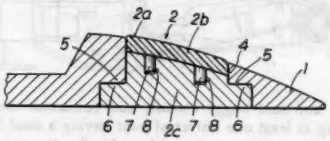
said toe piece comprising an enclosed housing having an open end through which said cam member projects for engagement with said front cam surface, said housing, cam member and said sole plate having fixed predetermined dimensions with respect to the direction of ski length, and said housing having a plurality of indicia thereon representative of various boot sizes, said indicia being located in predetermined positions on the housing selected in accordance with the dimensions of the housing, cam member and sole plate whereby the appropriate indicia for a selected boot size can be aligned with the mid-chord point of a ski to locate said housing on the ski in the desired position wherein the ball of the foot in a boot of the selected size will be located at a predetermined distance from the point of engagement of the cam member and the front cam of the sole plate.

3,944,238

GUIDE PLATE FOR SKI BINDINGS

Erwin Weigl, Brunn am Gebirge, and Josef Svoboda, Schwechat, both of Austria, assignors to Gertsch AG, Zug, Switzerland

Filed Feb. 18, 1975, Ser. No. 550,459
Claims priority, application Austria, Feb. 20, 1974, 1394/74
Int. Cl.² A63C 9/00
U.S. Cl. 280—11.35 C 2 Claims



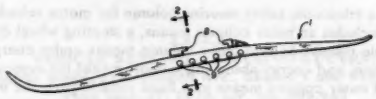
1. In a guide plate for use between a ski boot sole and an upper surface of a ski adjacent a ski binding component, said guide plate being fixed with respect to said ski and arranged within a support plate secured on said upper surface of said ski and having an upper surface projecting above said support plate, said support plate having an opening receiving said guide plate therein, the improvement comprising wherein said guide plate comprises a support member having an upper surface recessed below the upper surface of said support plate and a low friction guide surface mounted only on the upper surface of the support member, said guide surface projecting above the upper surface of said support plate, the lower portion of said support member engaging said upper surface of said ski, said support member having offset means thereon greater in dimension than said opening through said support plate and overlappingly cooperating with a correspondingly constructed holding part on said support plate to hold said support member and thereby said guide plate on said ski.

3,944,239

MODIFIED SNOW SKI

Bernard Lyle Hastings, 110 Wheeler Road, Wethersfield, Conn. 06109, and Arnold Sprung, 339 Cedar Drive West, Briarcliff Manor, N.Y. 10510

Filed Mar. 28, 1975, Ser. No. 563,415
Int. Cl.² A63C 5/04
U.S. Cl. 280—11.13 E 16 Claims



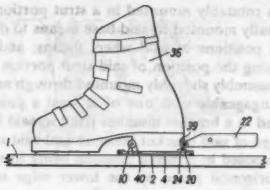
1. In a snow ski having a bottom running surface and side walls, the improvement which comprises a multiple number of spaced-apart members mounted along the side wall at the central binding portion of the ski, each said member defining a lower metal apex terminating not substantially below the plane of said running surface, laterally spaced outwardly from the side wall, with a free lateral space between it and the adjacent lower outer edge of the bottom surface, so that a line intersecting said apex and the closest adjacent point of the lower outward edge of the bottom running surface forms an acute angle of about 0 to 20° with said running surface plane.

3,944,240

SKI BINDING

Roland Bodendorfer, 25 Erdenweg, A-1140 Vienna, Austria

Filed June 10, 1975, Ser. No. 585,570
Claims priority, application Austria, July 19, 1974, 5966/74; Feb. 28, 1975, 1578/75
Int. Cl.² A63C 9/08
U.S. Cl. 280—11.35 T 7 Claims



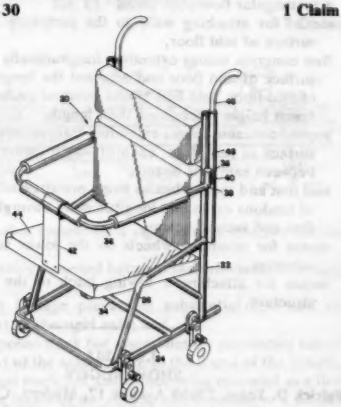
1. A ski binding comprising a baseplate adapted to be secured to a ski, a footplate guided by said baseplate, a spring-loaded tightener, and forward and rear rolling means for gripping a heel of a boot, said footplate having mounting means for displaceably mounting a rod, which extends in the skiing direction and is mounted by said mounting means so as to be adjustable in said direction, said rod having a cam face which is oblique in the skiing direction and which cooperates with means carried by said tightener so as to open the same when the ski binding is under an excessively high load in the skiing direction, said footplate being rotatably mounted on a pin which is carried by said baseplate at that end thereof which is nearer to the tip of the ski, said baseplate having guiding surfaces which cooperate during a rotation of said footplate about said pin with means carried by said rod so as to longitudinally displace the same, said forward rolling means being carried by said rod, said rear rolling means being carried by said footplate.

3,944,241

CONVERTIBLE CAR SEAT AND STROLLER

Quido C. Epelbaum, 5472 Walshire Drive, Columbus, Ohio 43227

Continuation of Ser. No. 301,305, Oct. 27, 1972, abandoned. This application Aug. 19, 1974, Ser. No. 498,444
Int. Cl.² B62B 1/04
U.S. Cl. 280—30 1 Claim



1. A children's car seat adapted for conversion to a stroller apparatus comprising, in combination, a generally L-shaped

frame means including substantially vertically disposed support members and a horizontally disposed base means adapted to rest substantially flush with the horizontally portion of an auto seat with the vertical frame portion substantially flush to the upright portion of the auto seat; a seat portion connected to said frame means and including a back rest portion, said seat portion being vertically spaced above said base means and including means to restrain a child's forward and sideward movement; handle means mounted on said frame means; wheel means rotatably mounted in a strut portion, said strut portion pivotally mounted to said base means to define raised and lowered positions of said wheel means; and means for releasably fixing the position of said strut portion including a locking pin assembly slideably mounted through said strut and alternately engageable with one of at least a pair of locking holes disposed in a bracket member fixed to said base means; the lower edge of said bracket member and said strut portion when it is disposed in a raised position being in substantially the same horizontal plane as the lower edge of said base means.

3,944,242

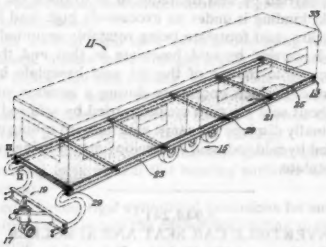
PRE-STRESSED, PRE-FABRICATED CONCRETE SUPPORTING STRUCTURE FOR A MOBILE HOME

Marcus P. Eubank, P.O. Box 7576, Longview, Tex. 75601

Filed Nov. 8, 1974, Ser. No. 521,962

Int. Cl.² B60R *27/00*; E04B *5/04*; E04H *1/02*

U.S. Cl. 280—30 **13 Claims**



1. A supporting structure for a mobile home comprising:

a rectangular floor,

means for attaching walls to the periphery of the upper surface of said floor,

first concrete beams extending longitudinally on the lower surface of said floor and adjacent the longitudinal edges of said floor, said first beams being of uniform cross-sectional height throughout their length,

second concrete beams extending transversely on the lower surface of said floor, each of which forms a connection between said first beams,

said first and second beams being pre-stressed by a plurality of tendons extending longitudinally through each of said first and second beams,

means for mounting wheels on the lower surface of said structure,

means for attaching a towing hitch to the front of said structure.

3,944,243

SHOW BUGGY

Patrick D. Yates, 23668 Avenue 17, Madera, Calif. 93637

Filed Oct. 23, 1973, Ser. No. 408,845

Int. Cl.² B62C *1/00*

U.S. Cl. 280—63 **7 Claims**

1. An improved buggy comprising:

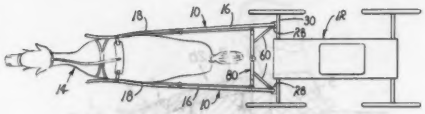
a chassis;

an axle connected to said chassis;

a pair of wheels connected to said axle;

elongated shaft means having a proximal end disposed for interconnection with said buggy chassis and a distal end disposed for interconnection with the harness on a draft animal; and

connector means interconnected with one of said ends of said shaft means for connecting said shaft means to said



harness and said buggy chassis, said connector means including at least one universal joint having a steel ball, a socket disposed to receive said steel ball, a top opening in said socket, resilient means projecting into said socket through said top opening and engageable by said ball when disposed in said socket to urge said ball out of said socket, and releasable lock means interconnected with said socket and disposed to hold said ball in said socket against said resilient urging.

3,944,244

TELESCOPIC SAFETY STEERING COLUMN FOR MOTOR VEHICLES

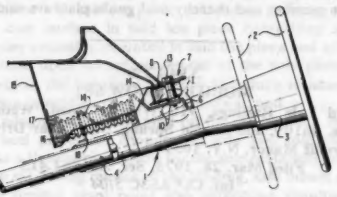
Wilhelm Albrecht, Vaihingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Nov. 26, 1974, Ser. No. 527,197

Claims priority, application Germany, Nov. 26, 1973, 2358733

Int. Cl.² B62D *1/18*

U.S. Cl. 280—87 R **17 Claims**



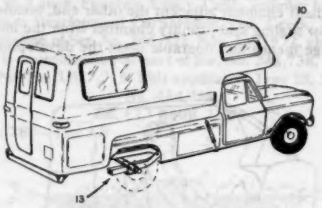
1. In a telescopic safety steering column for motor vehicles which includes an outer column means, a steering wheel displaceable relative to said outer column means under energy absorption, and energy-absorbing support means for supporting said outer column means at a fixed vehicle part, the improvement comprising said energy-absorbing support means including an undulated tubular member stably arranged parallel to the center longitudinal axis of said safety steering column, and fixing means for fixing said outer column means to said fixed vehicle part in proximity to said steering wheel, said fixing means including guide means for guiding said tubular member with respect to said axis upon impact against said steering wheel, characterized in that the guide means includes a guide strap, and characterized in that a bracket means which accommodates one end of the tubular member projects from the outer column means, the tubular member being pressed against the fixed vehicle part by said bracket means, and in that a cover means partly surrounding the tubular member and stressable in tension is provided which is connected with the fixed vehicle part.

3,944,245

MOTOR VEHICLE FRAME ASSEMBLY

Billy J. Kuhn, R.R. No. 2, Box 471 H, Bridgeport, Ind. 46231

Filed Aug. 5, 1974, Ser. No. 494,746
Int. Cl.² B62D 21/00
U.S. Cl. 280—106.5 R 4 Claims



1. A frame assembly for a motor vehicle comprising:

a main frame structure having a motor vehicle body affixed thereto and including a pair of side rails having a rear kick-up portion which extends rearwardly along the side rail, the body extending rearwardly and downwardly from the kick-up portion,

a pair of frame members pivotally attached to the side rails, each frame member extending rearwardly and positioned lower than the kick-up portion of the side rail to which it is attached, the rear axle of the motor vehicle being attached to the frame members near the rear ends of the frame members; and

a pair of springs, each spring of said pair being positioned between the rear end of one of said frame members and the underside of the rear end of the body behind the rear axle, said springs transmitting the weight of the rear end of the vehicle from points behind said axle, through the rear ends of said frame members to said axle to inhibit pitching motion of said body;

said frame members extending outwardly from their point of attachment to the kick-up portion as well as downwardly and rearwardly from their point of attachment to a level below the kick-up portion of the side rails, the assembly further comprising a pair of spring holders, one of said spring holders being rigidly attached to each of said side rails at a point laterally outside of the side rail and directly under the body behind the rear axle, each of said springs having a lower end mounted to one of said frame members at the rear end thereof and an upper end received in one of said spring holders, the lower ends of said springs being horizontally spaced from each other a greater distance than the spacing between said side rails at said spring holders to inhibit lateral roll motion of said body.

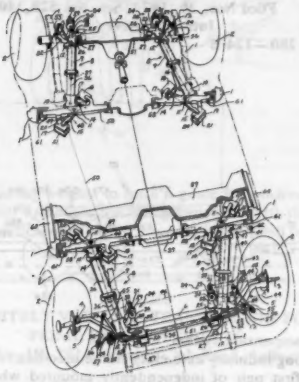
3,944,246

VEHICLE BANKING ARM CONSTRUCTION

Joachim Kolbe, 5126 Haskell Ave., Encino, Calif. 91316

Filed Sept. 27, 1974, Ser. No. 509,943
Int. Cl.² B60G 11/60
U.S. Cl. 280—112 A 6 Claims

1. In a vehicle having a superstructure and a banking support for the superstructure connecting the superstructure at its forward end to a wheel spindle carrying wheel supported rigid front axle structure and at its rearward end to a rigid wheel supported rear axle structure, said banking support comprising a plurality of pairs of cooperating roll banking arms, each arm including a longitudinally extending torsionally operated resilient spring means connected by a separate support member and a ball and socket joint at one end to the superstructure and at the other end to the respective rigid axle structure, and side lever arms forming a part of said separate support members and bearing at their outer ends against respective resilient multiturn cushions disposed at the opposite ends of the resilient spring means and bearing against the related rigid axle structure at one end and the superstructure at the other end to effect the torsional activation of said spring means under static load from the superstructure and also under lateral shift forces from the superstructure resulting from curve ride, the improvement comprising the interposition of a windup arm structure placed between the superstructure supported end of each banking arm and the superstructure, each windup arm



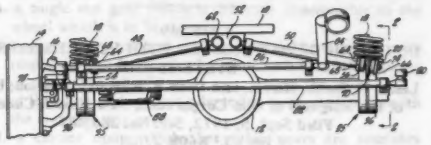
structure being removably connected at each end to the superstructure and supporting its corresponding banking arm ball and socket joint and multiturn cushion, to thereby provide torsional windup of the related banking arm resilient spring means and pressure application on all related multiturn cushions during the mounting process of the windup arm into the superstructure by first pivotally securing one end of said windup arm and thereafter pivoting said windup arm from an initially inclined position into the horizontal position, and thereafter securing the other end of said windup arm.

3,944,247

DOUBLE TRACK BAR SYSTEM

Charles E. Cook, 1800 Pasadena Ave., Los Angeles, Calif. 90031

Filed Nov. 19, 1973, Ser. No. 416,951
Int. Cl.² B60G 9/04
U.S. Cl. 280—124 R 7 Claims



1. A suspension system for a rigid axle on a motor vehicle comprising

springs operably mounted between the vehicle and the rigid axle;

constraining linkage preventing substantial fore and aft movement of the rigid axle; and

a pair of opposed track bar assemblies for preventing lateral movement of the axle relative to the frame of the vehicle, each of said track bar assemblies being mounted as a first end to the frame of the vehicle and mounted at a second end to the axle, said assemblies being extensible to accomodate vertical axle movement, a first one of said pair of opposed track bar assemblies being attached near one end of the rigid axle and a second one of said pair of

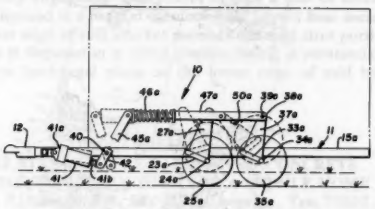
opposed track bar assemblies being attached near the other end of the rigid axle, said pair of opposed track bar assemblies extending inwardly therefrom to the frame of the vehicle.

3,944,248

SUSPENSION SYSTEM

Arthur L. Herrman, 8500 Penn Ave. South, Bloomington, Minn. 55431

Filed Nov. 29, 1974, Ser. No. 528,340
Int. Cl.² B60G *11/20*
U.S. Cl. 280—124 B **5 Claims**



1. A suspension system, including:
a. a longitudinally extending frame member;
b. a first pair of independently mounted wheel carrying axles rotatably mounted on a forward portion of said frame;
c. a second pair of independently mounted wheel carrying axles rotatably mounted on said frame rearwardly of said first pair of axles;
d. torsion spring, biasing means arranged on each of said axles;
e. said wheel carrying axles including a bellcrank arrangement for mounting of said wheels on said axles;
f. control means arranged on each of said axles for shifting thereof with respect to said frame member;
g. said control means including a first control member arranged to selectively shift said bellcrank member of one of said pairs of wheel carrying members with respect to said frame, whereby one of said pairs of wheel carrying axles will be shifted to a non-load carrying position; and
h. said torsion spring of said other pair of mounted axles is arranged and constructed to permit compression of said torsion spring and thereby lowering of said frame with respect thereto.

3,944,249

INFLATING DEVICE FOR USE WITH VEHICLE SAFETY SYSTEMS

Lester E. Smith, Herrin, and Dean R. Kilbourn, Marion, both of Ill., assignors to Olin Corporation, New Haven, Conn.

Filed Sept. 5, 1972, Ser. No. 286,481
Int. Cl.² B60R *21/08*
U.S. Cl. 280—150 AB **5 Claims**

1. An apparatus for use with a safety system of the type utilizing an inflatable member, a stored fluid under pressure, and a propellant charge for generating a hot gas, said apparatus comprising storage means for storing a fluid under pressure and including an outlet adapted to be attached to the inflatable member; means closing said outlet against fluid flow; propellant storage means including at least two propellant storage chambers for storing an ignitable propellant; a propellant charge in each of said propellant chambers; means sealing each of said propellant chambers from the interior of said storage means and operable upon development of a predetermined chamber pressure to unseal said chambers; condition responsive means for igniting all of said propellant charges sequentially; means operable upon the unsealing of the propellant chamber housing of the first ignited propellant charge and before the other propellant chamber is unsealed to disable said means closing said outlet to permit fluid and hot gas to flow through said outlet, said propellant storage means including an axially extending housing attached to said storage means; means in said housing dividing the interior thereof into a primary propellant chamber adjacent one end and a secondary propellant chamber adjacent the other end, means at said one end for sealing said primary chamber from the interior of said storage means and operable upon the development of a

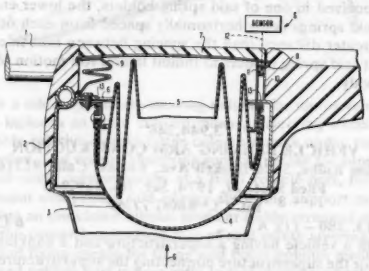
predetermined pressure in said primary chamber after ignition of the propellant charge therein to unseal said chamber, said means in said housing dividing the interior thereof including means operable upon development of a predetermined pressure in said secondary chamber after ignition of said propellant charge to provide communication between said secondary and said primary propellant chambers, said means for igniting said propellant charges in sequence igniting the propellant charge in said primary propellant chamber before igniting the propellant charge in said secondary propellant chamber.

3,944,250

AUTOMATICALLY INFLATABLE GAS CUSHION FOR THE PROTECTION OF THE PASSENGERS OF VEHICLES

Helmut Wulf, Nellingen, and Gerhard Schiesterl, Etting, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Dec. 1, 1972, Ser. No. 311,213
Claims priority, application Germany, Dec. 3, 1971, 2159947; Dec. 17, 1971, 2162687
Int. Cl.² B60R *21/10*
U.S. Cl. 280—150 AB **22 Claims**



1. A gas cushion for the protection of passengers of vehicles, expecially of motor vehicles which is automatically inflatable upon exceeding a predetermined deceleration of the vehicle and which is accommodated in a hollow space means disposed opposite the passengers, said hollow space means being closed off by a cover means adapted to be pushed out of a retaining means when the gas cushion is set into operation, characterized in that cover-displacing means are pro-

vided for displacing the cover means away from said hollow space means independently of the inflating gas cushion means.

3,944,251

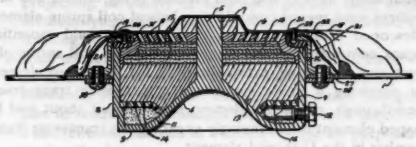
GAS GENERATOR FOR AUTOMOBILE DRIVER RESTRAINT BAG

Robert W. Lynch, Fountain Valley, Calif., assignor to Specialty Products Development Corporation, Oak Creek, Wis.

Continuation of Ser. No. 305,722, Nov. 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 248,738, April 28, 1972, Pat. No. 3,827,715. This application June 28, 1974, Ser. No. 484,266

Int. Cl.² B60R *21/08*

U.S. Cl. 280—150 AB **4 Claims**



1. An inflatable bag automobile driver restraint system comprising:

a generally cylindrical pyrotechnic gas generator including means for generating a sufficient volume of gas for inflating a driver restraint bag;

a recessed annular sealing surface around the face of the gas generator through which gas is released;

an inflatable bag subassembly including:

a folded inflatable bag,

a rigid ring in the mouth of the bag,

a rigid rim around the gas generator and having an inwardly directed flange,

means for connecting the inwardly directed flange and the ring with the mouth of the bag therebetween,

an outwardly directed flange on the rim for connecting the rigid rim to the gas generator; a resilient sealing gasket between the annular surface on the gas generator and the inwardly directed flange, the gasket, inwardly directed flange and ring collectively being about the same thickness as the depth of the recess adjacent the sealing surface on the gas generator; and

an adapter mounting plate connected to the gas generator and to the outwardly directed flange for attachment to a steering wheel.

3,944,252

TRACTOR FRONT-END WEIGHT ASSEMBLY

Hubert Barth, Mannheim, Germany, assignor to Deere & Company, Moline, Ill.

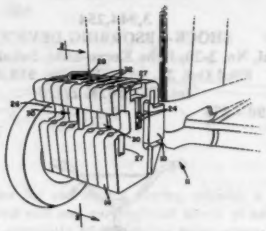
Filed May 8, 1975, Ser. No. 575,482

Claims priority, application Germany, Sept. 13, 1974, 2443809

Int. Cl.² B60R *27/00*

U.S. Cl. 280—150 E **9 Claims**

1. In a front-end weight assembly of the type including an elongate base weight adapted for connection to the forward end of a tractor and a plurality of plate-shaped weights, said base weight and said weights having cooperative surfaces disposed such that said weights may be suspended from said base weight, said weights having forwardly opening recesses in their forward edges forming recess means for receipt of an implement hitch ring and semi-cylindrical grooves disposed in the opposite transverse sides of each weight extending vertically in the region of each recess whereby opposed grooves in each two adjacent weights cooperate to form a vertical opening adapted to receive a hitch pin, the improvement comprising: a deflector positioned within the recess means and having a deflector surface disposed substantially parallel to the center axis of one of the vertical openings and spaced therefrom a distance greater than the radius of the hitch ring and outwardly inclined towards the front relative to the adjacent sides of the two adjacent weights forming the one of the vertical openings, said deflector surface operatively associated with



the two adjacent weights to form a guide for positioning the vertical center axis of the hitch ring coincident with the center axis of the vertical opening for insertion of the hitch pin therethrough.

3,944,253

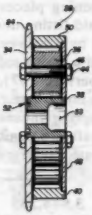
INFINITELY VARIABLE TRANSMISSION FOR PEDAL-DRIVEN VEHICLES

George Ripley, III, 2811 Country Club Road, Arlington, Tex. 76013

Filed May 7, 1974, Ser. No. 467,653

Int. Cl.² B62M *11/14*

U.S. Cl. 280—238 **33 Claims**



1. A pedal-driven vehicle including a frame and at least one driven wheel, and a variable-speed transmission including a planetary gear set, comprising:

a. a single sun gear which is drivingly connectable to the wheel which is to be driven;

b. an internally toothed ring gear rotatably mounted with respect to the frame at a location such that it is exterior of the driven wheel;

c. at least two pinion gears adapted to mesh at all times with the sun and ring gears;

d. a carrier upon which the pinion gears are rotatably mounted;

e. a cover plate which is coaxial with and spaced from the carrier by a distance slightly greater than the thickness of the pinion gears, and said cover plate being secured such that the pinion gears are retained between the carrier and the cover plate, and said ring gear being floatingly mounted with respect to the frame between the carrier and the cover plate;

f. means for transferring torque from at least one pedal to the carrier, whereby an operator acting on the pedal can impart torque to the carrier so as to cause it to rotate; and

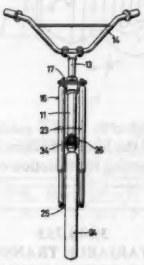
g. manually operable control means for regulating the amount of rotation which the ring gear is permitted to have with respect to the frame, such that the speed of rotation of the sun gear and hence the rotational speed of

the driven wheel can be affected by controlling the slippage of the ring gear as torque is applied to the carrier, and said slippage being adjustable through a plurality of step-less increments beginning with zero slippage.

3,944,254
SHOCK-ABSORBING DEVICE

Takao Inui, No. 2-20, I-cho Koryo-nishi, Sakai Osaka, Japan

Filed Oct. 25, 1974, Ser. No. 518,062
Int. Cl.² B62K 21/20
U.S. Cl. 280—276 2 Claims

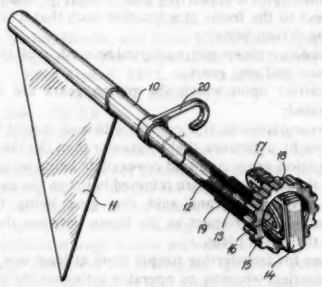


1. A shock absorbing arrangement for a bicycle comprising in combination:
   a. a head arbor (11) for holding a vertical handle shaft (13) having a lower enlarged portion (15) and an upper fitting unit (17);
   b. a front fork (16) including a pair of pipes (23) for a front wheel (24) and fastening pieces (21) for fastening said front fork (16) to said fitting unit (17); and,
   c. a spring holder (26) held between said pipes (23) having an aperture (27) and a spring supporting shaft (28) passing through said aperture (27), said spring supporting shaft (28) having an inner base (33) and an outer retaining nut (32) with spring means (34, 35) held on said spring supporting shaft (28), said spring supporting shaft (28) terminating in said enlarged portion (15).

3,944,255
SAFETY DEVICE

Lennart Sune Martinson, Vanadisvagen 29, Stockholm, Sweden (S-11323)

Filed Nov. 20, 1974, Ser. No. 525,632
Int. Cl.² B62J 5/00, 27/00
U.S. Cl. 280—289 8 Claims

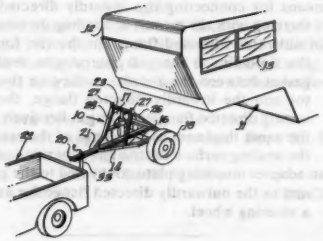


1. A signal-safety device for use on a bicycle-type vehicle for extending laterally therefrom and warning other vehicles to maintain a prescribed distance, said signal-safety device comprising; an elongated, substantially rigid element of a length defining a clear safe distance for passing vehicles; mounting means at one end of said element for mounting the rigid element in laterally-extending relationship from a frame member of the vehicle upon which the signal-safety device is to be used; a signal device at the other end of said rigid element for warning an oncoming vehicle of the presence of the vehicle upon which the signal-safety device is mounted and apprising the oncoming vehicle of the clear, safe distance at which to pass the signal-safety device; and a flexible, resilient joint means interposed between said rigid element and said mounting means so that the signal-safety device will yield when struck by an oncoming vehicle and will not damage the same nor the vehicle upon which it is mounted and will permit the signal-safety device to be folded along the frame of the vehicle upon which it is mounted to permit storage of the signal-safety device, said rigid element being tubular and said resilient joint means comprising a helical coil spring element telescoped into the tubular rigid element, said mounting means comprising a stud threaded into said coil spring element and a reverted, externally-threaded, U-shaped element for receiving a frame member of the vehicle transversely therethrough, and a nut element circumposed about said U-shaped element for clampingly engaging the transverse frame member in the U-shaped element.

3,944,256
FIFTH WHEEL DOLLY

Francis Hart, and Bessie M. Hart, both of 41 West 10th Ave., Mesa, Ariz. 85202

Filed July 19, 1973, Ser. No. 380,704
Int. Cl. B62d 53/04
U.S. Cl. 280—402 1 Claim



1. A detachable adapter fifth wheel dolly for connection to a conventional type coupling mounted on the forward lower portion of a conventional type of a fifth wheel trailer style mobile camper, the dolly intended for use in moving the camper from place to place about a campsite, the dolly comprising, in combination:
   an open type generally rectangularly configured frame member consisting of a plurality of independent sections of channel iron having their ends interconnected together to define the frame with all of the sections lying in a single plane, the frame having a back rail, a pair of parallel side rails connected to opposite ends of the back rail and projecting forwardly therefrom, and a pair of converging forward rails disposed in a general V-shaped configuration with the base thereof connected to the forward edges of said side rails and with the apex ends thereof being connected together and lying along the longitudinal midline of said frame;
   a pair of parallel transversely spaced apart longitudinally extending leaf springs, each spring secured to one of the frame side rails and extending longitudinally therealong with the ends of each leaf spring secured to the side rails by depending links associated with the side rails;

an axle assembly secured intermediate the ends of each of the leaf spring members and extending transversely of the frame parallel to the back rail thereof with the opposite ends of the axle extending outwardly from the adjacent-most side rails of the frame, the axle disposed transversely to the direction of travel of the frame;

a pair of wheels each rotatively affixed to an opposite end of said axle assembly for rotation on said axle assembly in planes parallel to said side rails when said frame member is transported from one location to another location;

a tongue channel frame member extending longitudinally along the mid line of said frame and forming an integral part thereof, the back end of the tongue member affixed centrally of said back end rail with a forward portion of said tongue member affixed to the apex of said converging forward rails with the front end of the tongue member projecting forwardly of said apex portion, said tongue member lying substantially co-planar with said frame and forming an integral part thereof;

a hitch socket formed as an integral part of said front end of said tongue member and projecting forwardly and outwardly therefrom and being of a size and configuration to readily fit a standard trailer ball hitch secured in a conventional manner to a motor vehicle for purposes of towing the frame;

an adjustable elongated standard secured to said tongue member intermediate said apex of said converging forward rails and said hitch socket, said standard extending normal to the axis of said tongue member and passing therethrough and affixed thereto with a portion of said standard projecting above said tongue member with the major portion of said standard extending below said tongue member in a generally vertical direction the bottom end of the standard having an associated flat foot portion affixed thereto and adapted to engage the ground surface for supporting the forward end of said frame when not hitched to a towing vehicle, said standard adjustable by an adjusting means including a hand crank for manual manipulation of said standard between a position where the foot portion engages the ground and the frame is supported in a substantially horizontal plane, and a retracted position wherein the foot portion is raised from the ground with the hitch socket affixed to a towing vehicle such that the standard does not interfere with the towing of the frame by the vehicle;

a pair of transversely spaced apart longitudinally extending inverted V-shaped angle members each lying in a vertical plane parallel to the side rails with each angle member disposed adjacent and inwardly of an associated one of said side rails and projecting upwardly therefrom with the ends of each of the angle members extending between the back rail and an end portion of the adjacent associated forward rail;

the apex portion of each of the angle members being in transverse alignment parallel to said axle assembly and disposed forwardly of said axle assembly;

a cross brace extending transversely of said frame with its opposite end portions resting on said apex portions of said angle members;

coupling means secured to said cross brace and adapted to detachably engage the coupling of the mobile camper for the towing of the same;

adjusting means for adjusting the height of said coupling means relative to said frame to enable said dolly to be adapted to fit a wide multitude of different types and styles of fifth wheel trailer style mobile campers and properly engage the dolly coupling means with the camper coupling;

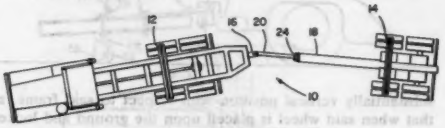
whereby, connection of said dolly coupling means to said fifth wheel trailer style mobile camper coupling allows the mobile camper to be moved and transported from place to place by a vehicle having a conventional standard trailer ball hitch affixed thereto and thus eliminating the need of a pickup style truck having a fifth wheel connection mounted in the bed thereof.

3,944,257

COMPENSATOR COUPLING FOR LOGGING TRUCK AND TRAILER

Lonnie L. Dockins, 1295 Magnolia Ave., Willits, Calif. 95490

Filed Jan. 9, 1975, Ser. No. 539,903
Int. Cl.² B60P *3/40*
U.S. Cl. 280—404 **4 Claims**



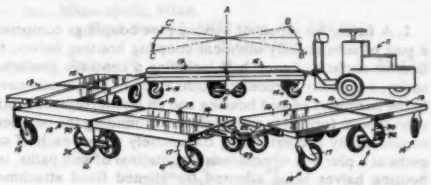
1. In a trailer for use with a towing vehicle: a reachpole having a forward end and a cylindrical sleeve at said forward end, the front extremity of the sleeve being open; and elongated, cylindrical member telescopically received within and movable longitudinally of the sleeve, the member having a front end exteriorly of the sleeve and provided with means on said front end for releasably attaching the same to a towing vehicle; a roller; and means rotatably mounting the roller on said forward end of the reach pole for rolling contact with the outer surface of said member, said roller having a spool-shaped, member-engaging surface which mates with and conforms to said outer surface of the member.

3,944,258

DOUBLE ENDED WAREHOUSE TRAILER

Carl O. Christensen, Alamo, Calif., assignor to Roll-Rite Corporation, Oakland, Calif.

Filed Dec. 9, 1974, Ser. No. 530,746
Int. Cl.² B62D *53/00*
U.S. Cl. 280—408 **19 Claims**



1. A double front ended warehouse wagon comprising:

a cargo-supporting bed, said bed including first and second sections semi-permanently joined end-to-end by articulated joint means for pivotal movement of said sections solely about a horizontal axis relative to one another;

at least a first set of non-steerable wheels mounted beneath said bed at said flexible joint means to support said bed at the center thereof, wherein said first set of wheels comprises at least a first pair of wheels mounted in tandem;

at least one self-steering wheel secured beneath said bed at each end to support the respective ends of the bed; and,

hitch means secured at each end of said wagon for cooperating with said self-steering wheels for defining a front end at each end of said wagon for hitching said wagon to another vehicle for towing in either direction.

3,944,259

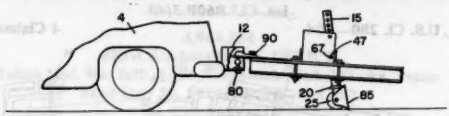
TRAILER JACKING DEVICE

Daniel C. Miller, Rte. 2, Box 355, Oakley, Calif. 94561

Continuation-in-part of Ser. No. 429,222, Dec. 28, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 542,648
Int. Cl.² B60D *1/14*
U.S. Cl. 280—475 **20 Claims**

1. An improved trailer jacking device comprising, in combination, a trailer tongue frame mounted at one end of a trailer,

an elongated, rigid strut one end of which is pivotally mounted medially of said frame and having a wheel at its other end free to rest upon the ground, said wheel being lockable with respect to said strut, and means for rigidly holding said strut in



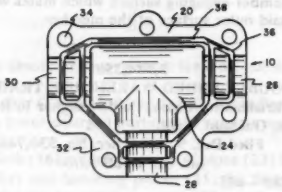
substantially vertical position with respect to said frame, so that when said wheel is placed upon the ground and locked and said strut pivoted into substantially vertical position with respect thereto, said frame will rise a preselected distance above the ground.

3,944,260

PIPE REPAIR FITTINGS

Frank G. Petroczky, 416 N. Maple Ave., Oak Park, Ill. 60302

Filed Jan. 8, 1975, Ser. No. 539,348
Int. Cl.² F16L *55/18*
U.S. Cl. 285—15 **6 Claims**



1. A fitting for repair of leaking pipe couplings comprising a pair of substantially identical coupling housing halves, the interior surface of each half including a centrally positioned cavity, a plurality of recessed paths extending from said cavity to the periphery of said housing and an uninterrupted, continuous groove formed in said surface surrounding the perimeter of said cavity and extending transversely across each of said paths at a plurality of positions longitudinal of said paths, said housing halves being adapted for aligned fixed attachment around a pipe coupling and a section of each of the pipes attached thereto with said coupling being positioned within a chamber formed by said cavities in said halves and said pipes being positioned within passageways formed by said paths in said halves, a continuous elastomeric gasket means positioned within a continuous passage formed by said grooves in said halves, said gasket means in said passage forming an uninterrupted, continuous fluid tight seal surrounding said chamber and crossing said passageways at a plurality of positions longitudinal thereof when said halves are fixedly attached whereby a leak at said coupling is surrounded and said leak is enclosed by said fluid tight seal.

3,944,261

BIFURCATED TUBING CONNECTOR

Charles C. Reed, Houston; Russell G. Sharp, Sugar Land, and Denton A. Cooley, Houston, all of Tex., assignors to Texas Medical Products, Inc., Houston, Tex.

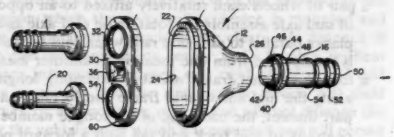
Filed Mar. 5, 1975, Ser. No. 555,749
Int. Cl.² F16L *47/02*
U.S. Cl. 285—21 **7 Claims**

1. A tubing connector for joining discrete fluid streams into a single fluid stream comprising:

a union assembly comprising;

a hollow body having a fitting at a first end, the opening accommodating reception of a tubing coupling, the body flaring outwardly to a second end; and

a cover configurated to mate with the second end of the body, the cover having at least two fittings, each fitting having a generally uniform size and configuration and accomodating reception of a coupling; and



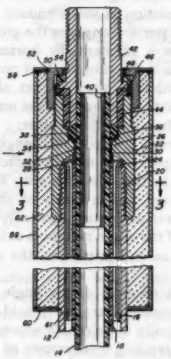
couplings having an adapter at a first end dimensionally configurated to mate with each of the fittings in the union assembly, at least one coupling having a preselected external diameter at a second end which is different from the external diameter at the second end of the other couplings to accommodate telescopic connection with tubes having at least two different internal diameters.

3,944,262

INSULATED METER RISER

Roy E. Stiner, and Robert P. Gardner, both of Tulsa, Okla., assignors to Continental Industries, Inc., Tulsa, Okla.

Filed Sept. 12, 1974, Ser. No. 505,472
Int. Cl.² F16L *57/00, 33/20*
U.S. Cl. 285—53 **6 Claims**



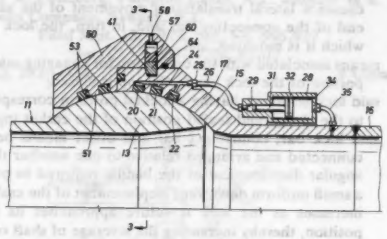
1. An insulated meter riser comprising a substantially L-shaped metallic sheath member, plastic pipe means concentrically disposed within said sheath member and extending longitudinally therethrough for connection between a buried plastic pipe and a metallic meter coupling, first compression nut means secured to one end of the sheath means, second compression nut means secured to the first compression nut means and cooperating with the meter coupling for securing the sheath means to the meter coupling, heat sink means disposed around at least a portion of the plastic pipe means, protective shield means disposed around at least a portion of the heat sink means, and foam insulation material disposed within the annular space contiguous with the inner periphery of the protective shield means for insulation of the plastic pipe against ambient temperature conditions.

3,944,263

DYNAMIC PIPE COUPLING

James F. Arnold, Houston, Tex., assignor to HydroTech International, Inc., Houston, Tex.

Filed Mar. 14, 1975, Ser. No. 558,428
Int. Cl.² F16L 17/00
U.S. Cl. 285—96 8 Claims



1. In a dynamic pipe coupling for connecting the ends of two pipes, the combination comprising:

a pair of coupling members, each of which is connectible at one end thereof to the end of one of said pipes;

one of said coupling members having attached thereto an annular enlarged portion having spherical-shaped axially forward and rearward sides;

the other coupling member having attached thereto a housing having a portion with an internal surface receiving the forward side of said enlarged portion in mating engagement therewith, said housing having a portion forming generally annular external shoulder means spaced generally radially outward from said internal surface;

a setting ring assembly mounted about said coupling members, said ring having a portion with an internal surface matingly engaging the rearward side of said enlarged portion, and having another portion receiving thereinto and radially surrounding at least that portion of the external surface of said other coupling member having said shoulder means;

said ring carrying generally radially movable wedge means for engaging said shoulder means upon actuation thereof and urging and holding said coupling members axially together;

and means for urging said wedge means generally radially inward into engagement with said shoulder means, whereby said coupling members hold said pipes against axial separation while permitting axial flexing therebetween.

3,944,264

PIPE BRACKET

William K. Mong, North Huntingdon, and Fred Temple, Pittsburgh, both of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

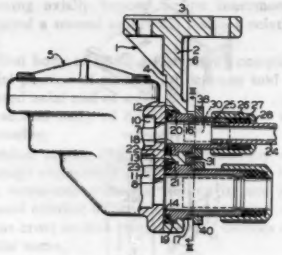
Filed Jan. 6, 1975, Ser. No. 538,597
Int. Cl.² F16L 39/00
U.S. Cl. 285—137 R 3 Claims

1. A pipe bracket for accommodating pipe connections to a fluid pressure operable device having a plurality of ports via which fluid pressure may flow to and from the device, said pipe bracket comprising:

a. a base plate portion on one side of which the fluid pressure operable device may be secured and having formed therein a similar number of transverse bores correspondingly located as the ports in the device so as to register therewith, respectively;

b. respective pipe connectors inserted a limited coaxial distance into said bores from said one side of said plate portion, each of said connectors having a stud portion protruding beyond the other side of said plate portion and to which a pipe may be connected;

c. a locking plate having a plurality of openings corresponding in number and position to said stud portions so as to fit thereon in a locking position in which said pipe connectors are locked against rotation in said transverse bores, respectively,



d. said openings each having internal flat surfaces which, in the locking position of said locking plate, engage complementary flat surfaces formed externally on each of said stud portions; and

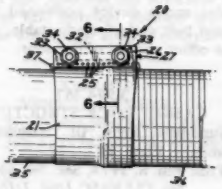
e. means securable on said stud portions for retaining said locking plate in its said locking position.

3,944,265

EXHAUST SYSTEM CONNECTOR SEAL

John R. Hiemstra, Rosemount, and Wayne M. Wagner, Apple Valley, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Nov. 15, 1974, Ser. No. 524,061
Int. Cl.² F16L 21/06
U.S. Cl. 285—419 16 Claims



6. In combination:

a pair of substantially incompressible tubular members of generally the same outside diameter to be joined in end to end relation;

a band ductile metal initially of strip form having end portions and bent to circular shape whereby the end portions confront one another, said band surrounding the joint between said members, the width of said band being generally the same as the diameters of said members, and a substantial portion of the width of said band engaging each of said members in direct contact therewith;

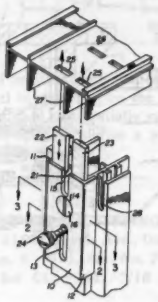
and means circumferentially stressing said band beyond its elastic limit, whereby to draw the band into intimate sealing engagement with the outer surfaces of said members, and maintaining said engagement when achieved, the ductile metal band being such that it yields before the material of said members.

3,944,266

LATCH FOR SLIDING DOORS

Earl W. Weaver, Youngstown, Ohio, assignor to P.D.I. Inc., Canfield, Ohio

Filed Apr. 9, 1975, Ser. No. 566,383
Int. Cl.² E05C 1/04
U.S. Cl. 292—145 2 Claims



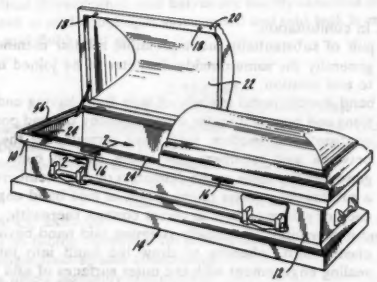
1. The combination of a latch and a sliding door having a forwardly offset portion on one of its vertical edges and having its upper edge movably engaged in a flanged track; said latch comprising a housing having a flat front portion and perpendicular, longitudinally extending flanges at its opposite edges positioned over said fowardly offset portion on the vertical edge of the door so as to straddle the same, a central opening in said flat front portion of the housing, a circular inturned flange around said central opening and a fastener positioned through said opening and engaged in said forwardly offset portion of said vertical edge of the door, a bolt plate slidably positioned in the area between the flat front portion of the housing and the offset portion of the edge of the door, a cutaway section in said bolt plate extending inwardly from the upper end thereof to provide clearance for said circular flange and fastener and so as to form spaced flat bolt portions movable outwardly of the housing for registry in spaced openings in said flanged track, an elongated slot in the flat front portion of said housing and a device positioned therethrough and engaged in said bolt plate for adjustable, frictional engagement with the offset portion of the door.

3,944,267

CASKET LOCK STRUCTURE

Arvid M. Sundquist, Elgin, Ill., assignor to Elgin Metal Casket Company, Elgin, Ill.

Filed Feb. 6, 1974, Ser. No. 440,016
Int. Cl.² E05C 1/08, 1/16
U.S. Cl. 292—158 12 Claims



1. A casket lock structure for securing a casket top in a closed and sealed position comprising:

an elongated lock bar and means for slidably mounting it along a casket wall, said bar having at least one hook portion;

a shaft to be rotatably supported through the casket wall at a point intermediate the length of the lock bar;

means for rotating said shaft;

a connecting bar having one end pivotally mounted to the lock bar at a point laterally offset from said shaft, offset means on said shaft being so associated with the other end of the said connecting bar that rotation of said shaft causes a lateral translational movement of the said one end of the connecting bar and, in turn, the lock bar to which it is mounted; and,

means associated with the casket top for engaging said hook portion of the lock bar as the top is closed;

said lock structure having a locked position corresponding to the closed and sealed position of the casket top; and

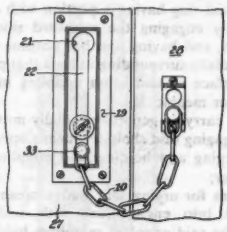
said lock bar, connecting bar and offset means being so connected and arranged relative to one another that the angular displacement of the handle required to produce a small uniform downward displacement of the casket top increases as the lock structure approaches its locked position, thereby increasing the leverage of shaft rotation to lock bar translation so as to maximize the closing force applied to the casket top as it approaches its closed and locked position.

3,944,268

SECURITY CHAIN LOCK

David A. Gonzalez, and Odette A. Peacock, both of Hollywood, Calif., assignors to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 7, 1975, Ser. No. 539,162
Int. Cl.² E05C 17/36
U.S. Cl. 292—264 2 Claims



1. A stop lock unit for securing the chain tab of a chain lock mechanism in place in the slotted lock plate of a conventional door chain lock mechanism, so as to prevent opening of the door chain lock mechanism, comprising

a conventional door chain lock mechanism with a lock plate that may be fastened to a door, said lock plate formed with a slot, one end of which is enlarged, and a chain that may be fastened to a door jamb, with the free end of the chain fastened to a tab member that may be inserted into the enlarged end of the slot of the lock plate and slid along the length of the slot,

a stop lock unit adaptable for mounting in the said slot so as to prevent the tab member inserted in the slot from sliding past the installed stop lock unit,

said stop lock unit being in the form of a pair of shaped plates joined by a reduced neck section and fitted with a through hole, together with a screw which loosely fits in said hole and is adaptable for engaging a threaded hole in the supporting member to which the lock plate is fastened behind the slot of the lock plate, when the stop lock unit is initially inserted into the enlarged end of the slot of the lock plate and then slid in the slot past the enlarged end, in which the neck of the stop lock unit is of lesser width

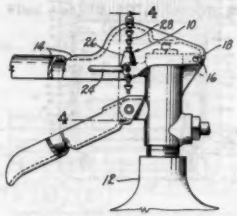
than the width of the slot in the lock plate so as to ride freely in the slot, with the tail plate of the stop lock unit being of greater width than the width of the slot of the lock plate but of a size to fit through the enlarged end portion of the slot of the lock plate.

3,944,269

SEAL

George A. Lundberg, Pompton Lakes, N.J., assignor to E. J. Brooks Company, Newark, N.J.

Filed Sept. 18, 1974, Ser. No. 506,937
Int. Cl.² B65D *27/30, 63/00*
U.S. Cl. 292—322 4 Claims



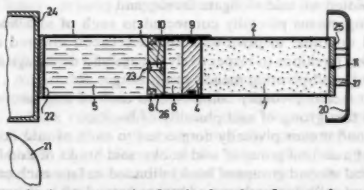
1. A seal for use with a device having an operating handle disposed on a handle support with apertures in the handle and support which are aligned when the handle is in the non-operating position, said seal comprising a rigid pin sized to closely fit and extend through the apertures and project from each side of the handle, a socket disposed at one end of the pin and a flexible shackle extending from the opposite end of the pin, said shackle having a central core having a diameter substantially less than that of the pin so as to be easily bendable and a series of locking enlargements formed thereon, said enlargements having a diameter not greater than that of the pin, and having a length such that it can pass around the handle and enter the socket, said socket having means for receiving said locking enlargements in non-separable engagement.

3,944,270

HYDROPNEUMATIC SHOCK ABSORBING MOUNTED BUMPER

Dieter Kreuzer, Schweinfurt am Main, Germany, assignor to Fichtel & Sachs AG, Schweinfurt am Main, Germany

Filed Sept. 10, 1973, Ser. No. 395,656
Claims priority, application Germany, Sept. 16, 1972, 2245590
Int. Cl.² B60R *19/06*; B61F *19/04*; F16F *5/00, 9/06*
U.S. Cl. 293—70 5 Claims



1. A hydropneumatic shock absorber for use between the chassis and bumper of an automotive vehicle comprising, in combination:

a. a cylinder having an axis and a cavity closed at one axial end;

b. a hollow piston assembly movable axially relative to said cylinder inward and outward of said cavity, said assembly including

1. a piston sealingly engaging said cylinder while said assembly moves, and

2. a piston rod fixedly fastened to said piston and axially projecting from the other axial end of said cavity;

c. stroke limiting means for preventing said assembly from moving axially beyond a first innermost position and beyond a second outermost position relative to said cavity;

d. a first body of liquid substantially completely filling the axial portion of said cavity between said piston and the closed axial end of said cavity;

e. a second body of liquid in the hollow interior of said assembly;

f. conduit means defining a permanently open throttling passage connecting said first and second bodies and having respective orifices in said cavity and in said interior,

1. said conduit means including an integral wall of annular cross section bounding said orifices and connecting the same,

2. the flow section of said passage being constant during axial movement of said assembly between said first and second positions; and

g. a body of gas sealed in said interior in pressure-transmitting relationship with said second body,

1. whereby the velocity of axial movement of said assembly inward of said cavity caused by applied external forces is descreased from an initial value by a resistance having a first component due to the throttling effect of said passage on the flow of said liquid and a second component due to the compression of said gas, and said movement is arrested in a terminal position of said assembly before said assembly reaches said first position when said initial value does not exceed a predetermined magnitude, said first component decreasing with the decreasing velocity of said assembly, and said second component increasing due to said assembly approaching said first position,

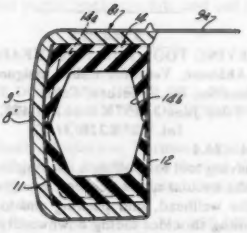
2. the amount and pressure of said gas being sufficient to make said resistance in said terminal position approximately equal to said resistance at said predetermined magnitude of said velocity, and sufficient to move said assembly from said terminal position into said second position in the absence of applied external forces.

3,944,271

VEHICLE BUMPER

Walter S. Eggert, Jr., Huntingdon Valley, Pa.

Filed July 5, 1974, Ser. No. 486,269
Int. Cl.² B60R *19/08*
U.S. Cl. 293—71 R 4 Claims



1. A vehicle bumper, comprising in combination, a thin resilient high-tensile longitudinal front plate, said front plate being transversely curved in vertical section, convex forwardly and concave rearwardly to buckle and bend longitudinally when a load exceeding a predetermined force is applied and

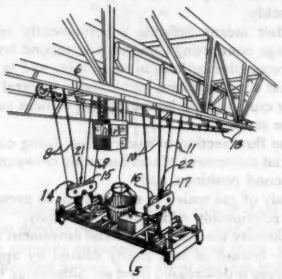
to restore to its original shape when said load is removed, a thin resilient high-tensile rear place located at a distance behind the front plate, and an intermediate hollow body of elastomeric material disposed between and secured to the front and rear plates.

3,944,272

CARGO CONTAINER SPREADER WITH ARTICULATED STRUCTURE FOR SKEWING AND TILTING

Jack E. Fathauer, Roxboro, N.C., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Aug. 12, 1974, Ser. No. 496,337
Int. Cl.² B66C 1/66
U.S. Cl. 294—81 SF **9 Claims**



1. In combination with a crane, a cargo container spreader comprising:

a main frame having longitudinal and transverse axis and means for connecting with a cargo container positioned underneath the frame;

a pair of normally upright subframes having means adapting them for separate supported pendant relation with said crane;

portions of each subframe and said main frame being pivotally connected to define separate hinge means, each hinge means attaching one of said subframes to said main frame along one of two axes parallel to, and spaced at opposite sides of, said transverse axis, said hinge means being constructed for relative movement of the main frame and each subframe lengthwise of the respective hinge axis; and

first power means operatively connected to each subframe and said main frame for reacting therebetween to effect said relative movement of the respective assembly and the main frame; and

separate vertically adjustable means for pendantly connecting each subframe with said crane, said adjustable means being independently adjustable to raise and lower each end of the spreader relative to its other end.

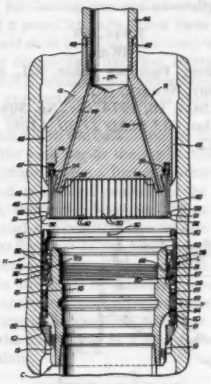
3,944,273

RETRIEVING TOOL FOR WELLHEAD PACKING

Arthur G. Ahlstone, Ventura, Calif., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed June 3, 1974, Ser. No. 475,586
Int. Cl.² E21B 31/02
U.S. Cl. 294—86.1 **18 Claims**

1. A retrieving tool for pulling a packing and locking apparatus from the annular space between a wellhead and a casing hanger in the wellhead, said packing and locking apparatus having a pulling shoulder facing downwardly, said tool comprising: a body having means connectable to an operating pipe string for lowering said body and pulling upwardly on said body, latch means carried by said body including circumferentially spaced flexible fingers having latch lugs projecting laterally outwardly therefrom and adapted to be disposed within said apparatus and below said pulling shoulder for engagement with said pulling shoulder, and fluid passage means in said body leading from said pipe string and comprising a plurality of nozzles within said fingers for discharging fluid



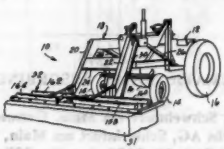
within said fingers and toward said lugs and to conduct washing fluid to the vicinity of said packing and locking apparatus.

3,944,274

BALE HANDLING DEVICE

Richard H. Mott, and Gary L. Erlenbusch, both of Sioux Falls, S. Dak., assignors to Du-Al Manufacturing Company, Sioux Falls, S. Dak.

Filed May 3, 1974, Ser. No. 466,620
Int. Cl.² B66C 3/04
U.S. Cl. 294—88 **11 Claims**



1. A bale handling device for connection to a loader, comprising:

an elongate frame including means for attaching said frame to said loader;

a plurality of bale engaging hooks individually pivotally mounted on said elongate frame; and

pivoting means pivotally connected to each of said hooks and operable to pivot said hooks between lowered and raised positions to respectively engage and disengage said bales, said pivoting means comprising

first means pivotally connected to each of said hooks of a first group of said plurality of hooks,

second means pivotally connected to each of said hooks of a second group of said hooks, said hooks of said first and second groups of hooks directed to face each other and said first and second means extending in the same direction, and

a hydraulic cylinder including an extensible piston, said piston connected to said first means and the free end of said cylinder connected to said second means, said

cylinder operable to move said first and second means forward and away from each other to pivot said hooks, comprising

a pair of spaced apart members each pivotally connected to the hooks of a sub-group of the respective group of hooks, and

an operating member connected between said spaced apart members and to the respective one of the free end of said cylinder and said piston.

3,944,275

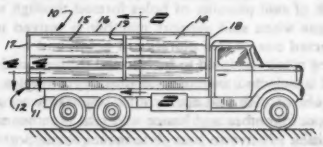
TRUCK BOX CONSTRUCTION

Vernon C. Lee, 1625 N. 4th St., Wahpeton, N. Dak. 58075, and Thomas L. Korinek, 306 Dacotah Ave., Breckenridge, Minn. 56520

Filed Aug. 19, 1974, Ser. No. 498,453

Int. Cl.² B62D 27/00

U.S. Cl. 296—28 M 7 Claims



1. A welded wall assembly construction for a truck or trailer box comprising a pair of metal panels having opposite side surfaces and end edges, and a tubular support stake between the adjacent ends of said panels and joining said panels in end to end relationship, and said ends of said panels being contiguous to and welded to opposite sides of said support stake whereby surfaces of said support stake form a portion of the wall assembly on both sides of said wall assembly between the ends of said panels, said support stake having a pair of generally planar side surfaces forming a lateral width of the stake in direction of the thickness of said panels, and wherein said panels are formed to be concave to provide increased rigidity in longitudinal direction, the amount of concavity of said panels being not substantially greater than the lateral width of said support stake so that the entire end edge of each of said panels adjacent said stake is contiguous to the stake and when welded to the stake a tight seam is formed.

3,944,276

ADJUSTABLE SEAT, ESPECIALLY FOR MOTOR VEHICLES

Daniel de Rosa, and Jacques Lacambre, both of Boulogne-Billancourt, France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of, France

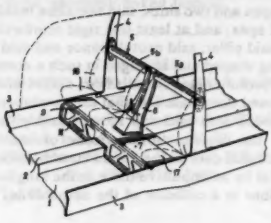
Filed Nov. 14, 1974, Ser. No. 523,921

Claims priority, application France, Dec. 13, 1973, 73.44601

Int. Cl.² B60N 1/06

U.S. Cl. 296—65 R 4 Claims

1. Adjustable seat, notably for motor vehicle, of the type comprising a bottom displaceable longitudinally on a slideway, a back rest having its lower edge hingedly connected to said bottom and its upper edge hingedly connected to a transverse shaft rigidly secured to the side walls of the passenger compartment, each end of said transverse shaft being connected to a first member and to a second member, said members being rigid with the lateral wall of the passenger compartment, said seat further comprising a first means for connecting said shaft to said first member and a second means for connecting said shaft to said second member, control means for rotating said shaft and thus produce a relative movement between said first and second connecting means, said second



connecting means being mounted for rotation and translation in relation to said second member.

3,944,277

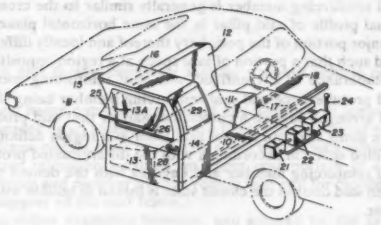
SIDEWARDLY MOVABLE VEHICLE SEAT WITH ENCLOSURE

Lloyd W. Cyphert, 252 E. Fifth St., Salem, Ohio 44460

Filed Nov. 1, 1974, Ser. No. 519,912

Int. Cl.² B60N 1/00

U.S. Cl. 296—68 4 Claims



1. A sidewardly movable seat for a vehicle having a body with a door opening in one side thereof comprising a platform and means in said vehicle movably mounting said platform for transverse motion with respect thereto, a seat on said platform including a back portion therefor, front, back and top walls on one portion of said platform arranged for telescopic movement with said platform into and out of said door opening of said body, a window in at least one of said walls and a door adapted for closing registry with said door opening and hinges mounting the same on one of said front and back walls to form a partial enclosure extending inwardly from said door and partially enclosing a portion of said platform and a portion of said seat thereon and means in said vehicle for moving said platform seat and partial enclosure into and out of said door opening.

3,944,278

AUTOMOBILE DOOR AND DOOR PILLAR ASSEMBLY PREVENTING DETACHMENT OF DOOR DURING COLLISION

Kunihiro Takahashi, Fujisawa; Norimoto Aya, Yokosuka; Kenji Osaka, Chigasaki, and Mithuru Furuta, Yokosuka, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Mar. 11, 1974, Ser. No. 450,164

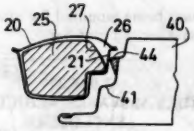
Claims priority, application Japan, Mar. 12, 1973, 48-27988; Mar. 12, 1973, 48-27989; Mar. 12, 1973, 48-27990

Int. Cl.² B60J 5/00

U.S. Cl. 296—146 9 Claims

1. In an assembly of an automobile door and a hollow pillar which hingedly holds the door, the improvement comprising

at least one protuberance of a generally vertical ridge shape formed on an edge face of said door opposite an end face of said pillar, the cross-sectional profile of said protuberance defining an apex and two sides, said two sides making an acute angle at said apex, and at least one rigid reinforcing member attached to said pillar, said protuberance and said reinforcing member being shaped and arranged in such a correlated manner that said protuberance is apart from said reinforcing member in the closed door state and that said protuberance comes into engagement with said end face of said pillar in confirmance with the cross-sectional profile of said reinforcing member when said door in the closed state is forced to collide with said pillar by an impulsive force in the longitudinal direction of the door in a collision of the automobile, so that said



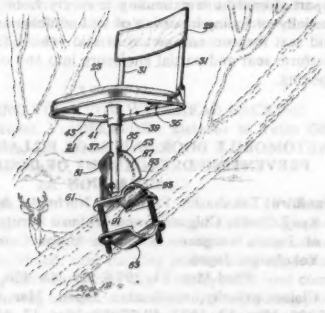
door is prevented from being laterally detached from said pillar, wherein said reinforcing member is disposed in the interior space of said pillar, and the cross-sectional profile of said reinforcing member is generally similar to the cross-sectional profile of said pillar in the same horizontal plane over a major portion of the periphery thereof and locally differentiated such that a portion of said space at a region opposite said protuberance is left unfilled with said reinforcing member, said protuberance and said reinforcing member being shaped and arranged in such a correlated manner that said protuberance dents said end face of said pillar at a region defining the unfilled space in accordance with the differentiated profile of said reinforcing member and engages with the dented region when said door in the closed state is forced to collide with said pillar.

3,944,279

HUNTER'S SEAT

Billy J. Blackstock, 1858 Belmont Blvd., Abilene, Tex. 79602, and Truman D. Adkisson, Rte. 1, Box 104A, Tuscola, Tex. 79562

Filed Mar. 5, 1975, Ser. No. 555,389
Int. Cl.² A47C 7/62
U.S. Cl. 297—217 **6 Claims**



1. A seat adapted to be attached to a tree or the like, for use by hunters or the like comprising:

an elongated support member having top and bottom ends,

a seat member having its bottom rotatably coupled to the top end of said support member,

two clamp members having inner sides adapted to engage the limb of a tree or the like,

adjustable means for coupling said clamp members together with their inner sides in engagement with the limb of a tree or the like for clamping said clamp members to the tree,

plate means fixedly connected to the outer side of one of said clamp members,

a plurality of spaced holes formed through said plate member in an arcuate pattern,

means for pivotally coupling the bottom end of said elongated support member to said plate at the center point of said arcuate pattern to allow said support member to be pivoted to different angular positions in an arcuate path next to said spaced holes,

said support member having an aperture formed therethrough at a distance from said center point equal to the distance between said plurality of spaced holes and said center point such that said aperture may be aligned with each of said plurality of holes formed through said plate means when said support member is moved next to a selected one of said plurality of holes, and

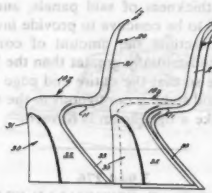
holding means adapted to be inserted through said aperture and a selected one of said plurality of holes when in alignment with said aperture for adjustably securing said support member and hence said seat member at a given position relative to said plate means to support said seat member in a generally horizontal plane.

3,944,280

STACKABLE CHAIR

Robert A. Keeler, Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Dec. 27, 1974, Ser. No. 536,717
Int. Cl.² A47C 3/04
U.S. Cl. 297—239 **4 Claims**



2. The chair of claim 1 in which said rearwardly and outwardly sweeping surfaces of said apron define scooped portions in said apron generally at the juncture of said front portion and said rearwardly extending side portions of said apron, said scooped portions providing foot room beneath the front portions of said seat.

3,944,281

MODULAR MEMBERS FOR COMPOSING PIECES OF FURNITURE, AS PADDED CHAIRS, EASY-CHAIRS, DIVANS AND DIVANS CONVERTIBLE IN BEDS

Giancarlo Piretti, Via Siepelunga 38/2°, Bologna, Italy (40141)

Filed July 18, 1974, Ser. No. 489,729
Int. Cl.² A47C 7/00
U.S. Cl. 297—440 **7 Claims**

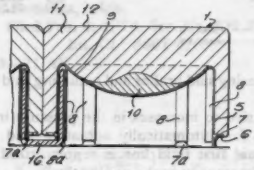
1. A set of modular members for removably assembling pieces of furniture, said set comprising:

a first main modular member having a square open base and a height less than the base side length;

a second main modular member substantially identical to said first modular member but having two vertical parallel walls having the same dimensions as those of the first member and an open rectangular base;

a third main modular member having a square open base with the length of the sides thereof being equal to the height of said first main member,

each of said main modular members comprising an inner box-like substantially rigid supporting structure, of which



at least the lower portion has a substantially horizontal rectangular cross section, a plurality of spaced substantially vertical channels projecting inwardly and located on the inner walls of said supporting structure, said channels having lower open ends spaced above the plane of the floor supporting the member, the outer surface of the supporting structure being covered by a padding material with an outer flexible cover; and

substantially U-shaped clamps adapted to be introduced from the bottom into two aligned channels of two adjacent modular members to removably connect the modular members.

3,944,282

ARTICLE OF FURNITURE FORMED BY INTERCONNECTED STRUCTURAL BODIES

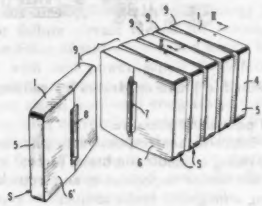
Tsugio Nakamura, Funabashi, Japan, assignor to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 30, 1974, Ser. No. 501,859

Claims priority, application Japan, Aug. 30, 1973, 48-102420[U]

Int. Cl.[2] A47C 7/00

U.S. Cl. 297—440 **8 Claims**



1. An article of furniture comprising:

interconnected structural bodies, each structural body including a frame body comprising a pair of identical spaced, opposed frame plates which narrow in width from the center thereof towards opposite ends, and another pair of identical, spaced, opposed frame plates whose width is constant for the entire length thereof, said pairs of frame plates being joined together at their ends to form an open hexagonal frame,

at least one wall plate laterally spanning said frame body and fixed at its edges thereto, and

connector means fixed to said at least one wall plate at the center thereof and extending outwardly therefrom at right angles to said wall plates for connecting said structural bodies, one to the other for limited pivoting about an axis parallel to a line passing through the center of the connecting bodies such that said frame bodies are stacked in fish bone, pivotably linked fashion.

3,944,283

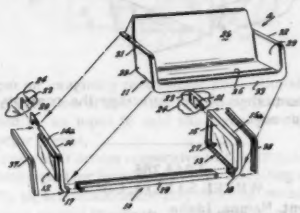
WALL MOUNTED SIDE FACING SEAT FOR TRANSIT VEHICLE

William R. Molzon, Rancho Palos Verdes, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Mar. 14, 1975, Ser. No. 558,462

Int. Cl.[2] A47C 7/02

U.S. Cl. 297—454 **13 Claims**



1. A side facing, cantilever seat for a transit vehicle comprising:

a seat frame comprising a pair of end members in opposed, spaced apart relation, at least a lower rear portion of each frame end member bearing on a side wall of such vehicle,

means releasably securing an upper rear portion of each frame end member to such vehicle side wall for cantilever support of the seat frame,

a stretcher extending between, and secured to, the lower front portions of the two frame end members,

an integral, one piece seat insert of sheet material fitted into the frame and supported thereby, said insert comprising,

a generally horizontal seat portion and a generally upright back portion defining therebetween a selected seating angle, said seat insert having an integral end portion on each end thereof, said insert end portions fitting between the frame end members with a forward edge portion of the insert seat portion resting on, and supported by, the stretcher.

3,944,284

TILTING, SLIDING EDGE DISPENSER

Loren W. Kent, 1239 E. Carleton Ave., Orange, Calif. 92667

Filed Dec. 6, 1974, Ser. No. 530,140

Int. Cl.[2] B60P 1/30

U.S. Cl. 298—14 **8 Claims**

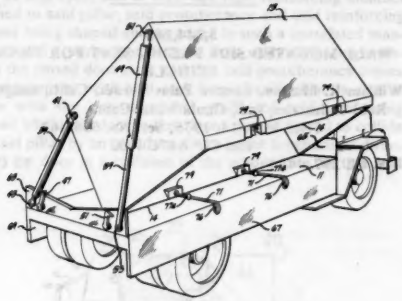
1. Dispensing apparatus comprising:

a base member having a flat planar surface thereon;

a container having at least one opening therein, said opening being normally closed by said planar surface when said container is in a first position relative to said base member, a portion of said opening having a linear edge, said container being adapted to be moved across said planar surface from said first position to a second position, keeping said linear edge in sliding contact with said planar surface; and

connecting means having two ends, one end being rotatably attached to said container and the other end rotatably attached to said base member such that when said container is moved across said planar surface from said first position to said second position, said container tilts with

respect to said planar surface and slides thereacross on said linear edge thereby opening said container to release



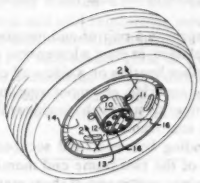
the contents thereof and to scrape the contents before said linear edge.

3,944,285

WHEEL SAFETY LOCK

Gerald Vincent, Nampa, Idaho

Filed May 23, 1973, Ser. No. 363,208
Int. Cl. B60b *3/16*
U.S. Cl. 301—9 DN **4 Claims**



1. A wheel safety lock, comprising: a hollow hub cylinder being engagable with a wheel hub; a diameter web fastened at one of the terminal ends of

said wheel hub; and

a camming actuator means, said camming actuator means for demountably retaining said hub cylinder on said wheel hub including opposingly disposed arms having at one of their terminal ends lug blocks engagable with recesses in said hub at one of their terminal ends, means disposed at the ends opposite said blocks for urging on said arms for urging said arms centrally together, and actuator means for selectively forcing said arms apart.

3,944,286

BRAKE SYSTEM INCLUDING MEANS FOR ENSURING PARKING BRAKE RELEASE

Thomas H. Engle, Cape Vincent, and Thomas M. Bogenschutz, Clayton, both of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed Sept. 19, 1974, Ser. No. 507,516
Int. Cl.² B60T *17/16*
U.S. Cl. 303—13 **7 Claims**

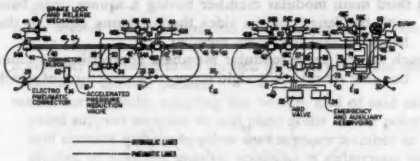
1. A brake apparatus for a vehicle, comprising:

a first normally pressurized fluid line for transmitting fluid pressure corresponding to a desired brake application force;

means responsive to reductions in the pressure in said first line for effecting service and emergency application of the brakes of said vehicle;

means for locking said brakes to retain them in the applied condition and for unlocking said brakes to allow them to return to the released condition;

independently operably parking brake actuating means for applying said brakes and actuating said locking means



and for releasing said brakes and actuating said unlocking means; and

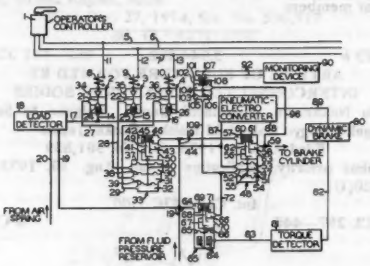
means responsive to increases in the pressure in said first line means for automatically actuating said unlocking means as said first fluid line is repressurized following service or emergency brake application.

3,944,287

ELECTRO-PNEUMATIC BRAKE APPARATUS FOR RAILWAY VEHICLES

Minoru Nagase, Kobe, Japan, assignor to The Nippon Air Brake Company, Ltd., Kobe, Japan

Filed Apr. 7, 1975, Ser. No. 565,938
Claims priority, application Japan, Apr. 18, 1974, 49-43937; May 14, 1974, 49-54690[U]
Int. Cl.² B60T *13/68, 15/14*
U.S. Cl. 303—15 **8 Claims**



1. Electro-pneumatic brake apparatus for railway vehicles comprising:

a. a source of pneumatic pressure;

b. pneumatic brake means responsive to pneumatic pressure for providing a pneumatic brake force;

c. dynamic brake means responsive to an electrical impulse for providing a magnetic brake torque;

d. operator actuated means providing a brake-initiating signal of preselected magnitude;

e. primary relay valve device connected to said source of pneumatic pressure and to said operator actuated means and operable responsively to said brake-initiating signal to produce a first control pressure;

f. a pneumatic-electro converter device connected to said primary relay valve device and to said dynamic brake means for converting said first control pressure to an electrical impulse transmitted to said dynamic portion for producing said magnetic brake torque;

g. electro-pneumatic converter means connected to said dynamic brake means for receiving and converting said magnetic brake torque to a second control pressure; and

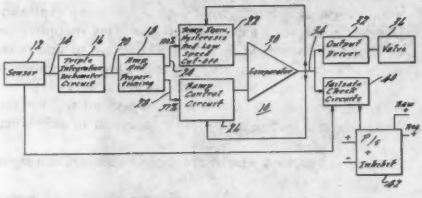
h. a secondary relay valve device connected to said source of pneumatic pressure, to said primary relay valve device,

and to said electro-pneumatic converter means, and operable responsively to said first and second control pressures for effecting supply of operating pneumatic pressure from said source to said pneumatic brake means at a degree according the differential between said first and second control pressures for producing a corresponding brake force.

3,944,288
SKID CONTROL SYSTEM FOR TWO-WHEELED VEHICLES

Robert B. Bertolasi, Rockford, Ill., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Feb. 4, 1974, Ser. No. 439,296
Int. Cl.² B60T 8/10
U.S. Cl. 303—21 AF **11 Claims**



1. In combination in a skid control system for use in connection with controlling the braking action of at least one wheel of a vehicle, a wheel speed sensor for sensing the rotational speed of the wheel, a wheel speed signal generator connected to the wheel speed sensor for generating a signal representative of the rotational speed of the wheel, a vehicle speed signal generator for generating a signal representative of the vehicle speed, comparator circuit means connected to the wheel speed signal generator and the vehicle speed signal generator for generating an output signal when said wheel speed and said vehicle speed achieve a preselected relationship, output circuit means for generating an output signal to control the vehicle brakes, a power supply connected to said wheel speed signal generator, vehicle speed generator and comparator circuit means for supplying electrical energy to said circuits, and sensor failure circuit means for sensing the open or shorted condition of said wheel speed sensor including means associated with said power supply for shutting down said power supply in response to a fault of the sensed generation of an output signal from said comparator circuit means and the absence of a correlative output signal from said output circuit means for controlling the vehicle brakes, and in response to a fault of sensing said open or shorted condition of said wheel speed sensor, and automatically resetting said power supply in the absence of said faults.

3,944,289
SKID CONTROL SYSTEM

James J. Jones, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 25, 1974, Ser. No. 454,334
Int. Cl.² B60T 8/08
U.S. Cl. 303—21 BE **5 Claims**

1. A vehicle skid control system for selectively controlling the engagement and disengagement of the brake system of the vehicle in accordance with selected braking conditions, comprising in combination:

means for generating a signal proportional to vehicle wheel speed,

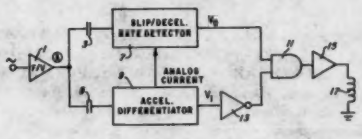
a slip signal-deceleration rate detector means,

an acceleration differentiator means connected in parallel to said slip signal-deceleration rate detector means,

said wheel speed signal generating means being connected to the inputs of said slip signal-deceleration rate detector means and said acceleration differentiator means for simultaneously providing said wheel speed signal thereto,

said slip signal-deceleration rate detector means being responsive to a negative slope of said wheel speed signal exceeding a predetermined deceleration rate threshold for providing a first brake control signal as an output,

said acceleration differentiator means being responsive to a positive slope of said wheel speed signal to provide as one



output an imaginary ramp signal proportional to the rate of acceleration of said wheel speed signal and being connected as an input to said slip signal-deceleration rate detector means,

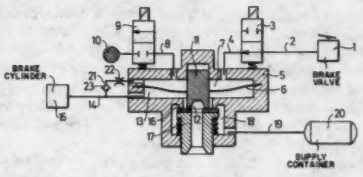
brake controller means responsive to at least said first brake control signal for providing a brake inhibiting signal, and

said slip signal-deceleration rate detector means being responsive to said imaginary ramp signal from said acceleration differentiator means for discontinuing said first brake control signal when the acceleration spin-up causes said wheel speed signal to intersect with the imaginary ramp programmed by said imaginary ramp signal.

3,944,290
MOTOR VEHICLE BRAKE SYSTEM WHEEL LOCK PREVENTION DEVICE

Hermann J. Goebels, Schwieberdingen; Klaus-Otto Riesenberg, Ludwigsburg-Osswell, and Helmut Rembold, Moglingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Apr. 1, 1975, Ser. No. 563,968
Claims priority, application Germany, Apr. 20, 1974, 2419135
Int. Cl.² B60T 8/02, 15/02
U.S. Cl. 303—21 F **11 Claims**



1. In a wheel lock prevention device for use in the brake system of motor vehicles, the combination comprising: a relay valve; a motor vehicle operator controlled brake valve; a wheel brake cylinder; and a source of pressurized air, wherein the relay valve includes: means defining a primary pressure side and a secondary pressure side, with the primary pressure side having means for connecting the primary pressure side to the brake valve for actuation therefrom, and with the secondary pressure side having means for connecting the secondary pressure side to the wheel brake cylinder; means on the secondary pressure side defining a double valve; means connecting the double valve to the source of pressurized air; and further means for connecting the double valve to the atmosphere, the double valve serving to connect the secondary

pressure side to either the source of pressurized air or the atmosphere, the improvement comprising:

a. a short circuit connection which extends between and connects the primary pressure side with the secondary pressure side; and

b. control means connected to said short circuit connection for controlling the short circuit connection in order to effect balancing of the pressures on both the primary and secondary pressure sides after the pressure on the primary and secondary sides has been reduced from a peak value by a desired extent during application of the brake system.

3,944,291

ANTISKID BRAKE CONTROL SYSTEM AFFORDING ACCELERATION CONTROL OF A SKIDDING WHEEL RUNNING ON A LOW ADHESION ROADWAY

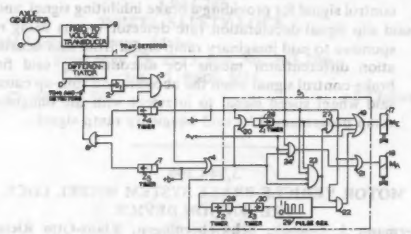
Lindemann, Hannover; Lutz Weise, Misburg, and Dieter Luhdorff, Hannover, all of Germany, assignors to WABCO Westinghouse GmbH, Hannover, Germany

Filed July 11, 1974, Ser. No. 487,677

Claims priority, application Germany, Oct. 3, 1973, 2349681

Int. Cl.² B60T 8/08

U.S. Cl. 303—21 A **1 Claim**



1. An antiskid brake control system for a vehicle having brake means subject to operator controlled fluid brake pressure, wherein modulation of the operator controlled brake pressure at each individual wheel is accomplished according to the dynamic condition of the respective wheel, said system comprising:

a. means for generating a speed signal of a wheel according to its angular velocity;

b. means for differentiating said wheel speed signal to provide an output signal having an amplitude proportional to the rate of change of said wheel speed signal;

c. means subject to said output signal for providing a deceleration signal when the wheel deceleration exceeds a preselected deceleration threshold;

d. means subject to said output signal for providing a first acceleration signal when the wheel acceleration exceeds a preselected acceleration threshold;

e. means subject to said output signal for providing a second acceleration signal when the wheel acceleration exceeds a preselected acceleration threshold lying below the acceleration threshold of said first acceleration signal;

f. first valve means with each wheel for controlling the delivery of the operator controlled fluid brake pressure to said brake means thereof;

g. second valve means with each wheel for controlling the release of fluid brake pressure from said brake means thereof;

h. wheel behavior evaluation means subject to said deceleration signal for concurrently effecting operation of said first and second valve means in such sense as to respectively cut off the delivery of brake pressure to said valve means and release brake pressure from said valve means;

i. means for providing a velocity signal when said speed signal is a predetermined amount less than a reference signal approximating actual vehicle velocity, said reference signal corresponding to said speed signal until said deceleration signal arises, at which point said reference signal decreases in accordance with a predetermined time constant.

j. said wheel behavior means being operative upon disappearance of said deceleration signal to cause said second valve means to terminate the release of brake pressure and being further operative responsive to either said velocity signal or one of said first and second acceleration signals to cause said first valve means to remain operative in such sense as to continue interrupting delivery of operator controlled brake pressure to said brake means whereby the fluid brake pressure is maintained constant in a holding phase of brake control; and

k. control means for establishing connection of said second acceleration signal with said wheel behavior evaluation means when said first acceleration signal fails to arise within a predetermined time period following expiration of said deceleration signal in order to delay reapplication of operator controlled fluid brake pressure to said brake means by said first valve means following termination of said velocity signal; said control means comprising:

i. an OR gate subject to said first and second acceleration signals and having an output connected to said wheel behavior evaluation means;

ii. an AND gate via which said second acceleration signal is connected to said OR gate;

iii. means for providing said predetermined time period during which a time signal is established;

iv. second AND gate means subject to said time signal and said first acceleration signal and having an output connected to said first AND gate to enable said first AND gate in the absence of said first acceleration signal only when said predetermined time period has expired.

3,944,292

LOAD RESPONSIVE PRESSURE MODULATING VALVE DEVICE FOR USE IN A BRAKE SYSTEM OF A VEHICLE

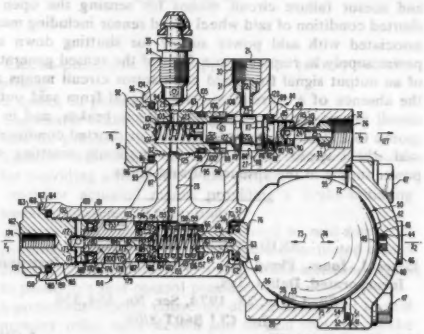
Kaname Doi, and Hiroaki Nagara, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 13, 1973, Ser. No. 387,974

Claims priority, application Japan, Aug. 12, 1972, 47-80933

Int. Cl.² B60T 8/24, 8/26, 8/18

U.S. Cl. 303—24 C **10 Claims**



1. A load responsive pressure modulating valve device for use in a brake system of a wheeled vehicle, having front and rear wheel braking means, said device provided with means for modulating a hydraulic brake pressure supplied to the front and rear wheel braking means so as to distribute the hydraulic brake pressure corresponding approximately to a

weight transfer in the vehicle caused by the braking operation to said front and rear wheel braking means, whereby the hydraulic brake pressure supplied to said rear wheel braking means is reduced in comparison with that supplied to said front wheel braking means, comprising: means for modulating said hydraulic brake pressure so that a starting pressure for directing the pressure modulating operation thereto is controlled by a partial pressure of said hydraulic brake pressure; means for detecting the deceleration of the vehicle disposed in a branch circuit of the hydraulic brake pressure circuit including either of said front and rear wheel braking means, said detecting means being movable in response to a predetermined deceleration of the vehicle corresponding to the hydraulic brake pressure for a light load condition; means disposed in a branch circuit of the hydraulic brake pressure circuit including either of said front and rear wheel braking means for separating said partial pressure of said hydraulic brake pressure in response to the displacement of said deceleration detecting means in order to apply said partial pressure to the control of said starting pressure; and means disposed in a branch circuit of the hydraulic brake pressure circuit including either of said front and rear wheel braking means for sensing and controlling the hydraulic brake pressure which increases in proportion to said predetermined deceleration in response to an increase of a value of the hydraulic brake pressure required for generating said predetermined deceleration of the vehicle by utilizing characteristics that said pressure value for generating said predetermined deceleration speed increases in proportion to an increase of a load of the vehicle, whereby the hydraulic brake pressure matching the weight transfer caused by the braking operation under any load condition of the vehicle is distributed to said front and rear wheel braking means, respectively.

3,944,293

HYDRAULIC BRAKE CONTROL ASSEMBLY

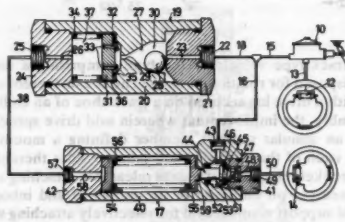
Noriakira Ishigami, Chiryu, and Hideyuki Kobayashi, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Nov. 25, 1974, Ser. No. 527,078

Claims priority, application Japan, Nov. 23, 1973, 48-132035

Int. Cl.² B60T 8/14

U.S. Cl. 303—24 F **9 Claims**



1. A hydraulic brake control assembly for automotive vehicles having front and rear wheel brake means, comprising:

a dual master cylinder;

a proportioning valve interposed between said master cylinder and one of said wheel brake means and including a reciprocable valve piston for effecting a proportioning operation, said valve piston having an area free from the hydraulic pressure of said master cylinder,

a first device having a first piston and a first spring normally urging said valve piston to move to a position wherein hydraulic pressure in said master cylinder is admitted to said one of said wheel brake means without said proportioning operation of said valve,

a second device fluidically interposed between said master cylinder and said first piston of said first device and including a vehicle deceleration sensing assembly and a check valve assembly, said vehicle deceleration sensing assembly controlling admission of the hydraulic pressure from said master cylinder to said first piston according to the condition of loading of the vehicle, said check valve assembly controlling said admission of the hydraulic pressure according to an increase of hydraulic power,

said first piston of said first device being supplied with hydraulic pressure to thereby urge said valve piston to move to said position in addition to said first spring, wherein the pressure receiving area of said first piston is of an increased ratio to said area of said valve piston whereby the hydraulic pressure admitted from said second device to said first piston acts on said valve piston with an increased ratio,

whereby said proportioning valve operates its proportioning operation in accordance with the condition of loading of the vehicle.

3,944,294

COMBINED LOAD-SENSING PROPORTION AND RELAY VALVE FOR AN AIR BRAKE SYSTEM

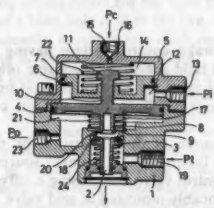
Naosuke Masuda, and Itiro Yanagawa, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed May 10, 1974, Ser. No. 469,006

Claims priority, application Japan, June 8, 1973, 48-64465; Nov. 28, 1973, 48-133264

Int. Cl.² F16K 31/12; F15B 13/042

U.S. Cl. 303—40 **8 Claims**



1. A combined load sensing proportion and relay valve assembly for an air brake system comprising: means defining a flow path through said valve assembly between an inlet port and an outlet port, said flow path including an outlet pressure chamber; a main valve mechanism including a valve seat and a valve disc, said valve disc being biased into engagement with said valve seat to block said flow path; a first pressure-sensitive piston including means projecting from one side thereof for abutment with said valve disc to unseat said valve disc from said valve seat to effect opening of said flow path through said valve assembly; a second pressure-sensitive piston; engaging means extending between said first and second pistons to enable free relative movement therebetween within a limited range and causing said second piston to abut said first piston in opposition to movement of said first piston to unseat said valve disc when said pistons move relative to each other beyond said limited range; control-pressure chamber means having a control pressure therein acting against one side of said second piston to urge said second piston to move away from abutment through said engaging means with said first piston; stopper means for limiting the extent of movement of said second piston in response to said control pressure in said control pressure chamber means; indicated-pressure chamber means indicated pressure created therein upon actuation of said braking system, said indicated-pressure chamber means being configured to cause said indicated-pressure therein to act simultaneously against both said first and said second pistons, said indicated-pressure acting upon one side of said first piston to drive said first piston in a direction

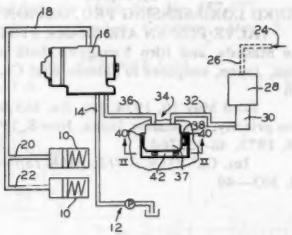
toward unseating of said valve disc and against one side of said second piston in opposition to said control pressure; and means for applying the pressure in said output pressure chamber against the side of said second piston opposite the side against which said indicated pressure is applied, with the pressure in said output pressure chamber being balanced against said indicated-pressure to open and close said valve assembly flow path in accordance with the control pressure developed in said control pressure chamber means.

3,944,295

TOWING VALVE ARRANGEMENT FOR FAIL-SAFE BRAKE SYSTEM

Michael K. Lloyd, Sandy City, Utah, and Paul C. Rosenberger, Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 30, 1975, Ser. No. 545,642
Int. Cl.² B60T 17/16
U.S. Cl. 303—89 **9 Claims**



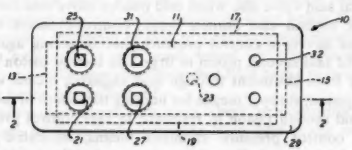
1. A vehicle brake control system having spring applied brake means and fluid pressure responsive release means;
- a brake control valve for controlling said brakes;
- a primary source of fluid pressure for controlling said brakes;
- an auxiliary source of fluid pressure for controlling said brakes upon failure of said primary source;
- an auxiliary control valve comprising a valve body, a valve spool reciprocably mounted in said valve body and movable between a communicating position and a noncommunicating position, for controlling communication of said auxiliary source with said control valve, both ends of said valve extending from said valve body; and,
- locking means including a bracket operative to engage both ends of said spool and adapted to be secured in a fixed position to block movement of said spool to said communicating position.

3,944,296

TRACK PAD FOR ASPHALT PAVING MACHINE

Peter A. Stampone, Livingston, N.J., assignor to Tuff Manufacturing Co., Inc., Saddle Brook, N.J.

Filed Mar. 12, 1975, Ser. No. 557,763
Int. Cl.² B62D 55/22
U.S. Cl. 305—35 R **14 Claims**



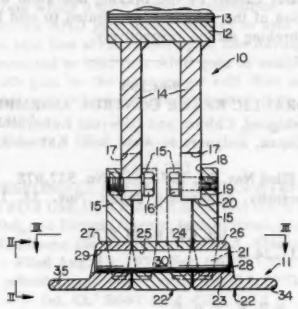
1. A method for manufacturing a track pad for a tracked vehicles said track pad having a generally planar rectangular base plate with a plurality of openings, a securing means extending through at least one of said plurality of openings for removably attaching the track pad to a track of said tracked vehicles and a pad means of polymer substantially totally encapsulating said base plate but which includes at least one openings to permit the extension therethrough of a portion of said securing means, comprising:
- positioning said securing means in said support plate to form a sub-assembly
- positioning said sub-assembly within a die wherein said securing means extend from the die cavity and as such, avoids encapsulation by said polymer;
- securing said sub-assembly within said die by means of a plurality of positioning projections which extend from said inner surface of said die into said die cavity making surface to surface contact with said base plate
- injecting polymer into said die to fill said space between said inner surface of said die and said base plate;
- maintaining said die in a closed position for sufficient time to permit setting of said polymer material
- removing said track pad from said die after setting of said polymer.

3,944,297

ADJUSTABLE SPROCKET DRIVE FOR TRACK-TYPE VEHICLES AND METHOD FOR USING THE SAME

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 29, 1974, Ser. No. 528,365
Int. Cl.² B62D 55/20
U.S. Cl. 305—57 **22 Claims**



1. In a track-type vehicle of the type comprising a drive sprocket disposed for rotation about a central axis thereof and engaged with a drive lug secured on a track shoe of an endless track assembly, the improvement wherein said drive sprocket comprises an annular support member defining a mounting surface on each of the outboard and inboard sides thereof, a toothed sprocket member and means releasably attaching said sprocket member on only one of the outboard and inboard sides of said support member and for selectively attaching said sprocket member on the other one of said outboard and inboard sides of said support member, said sprocket member being disposed on said support member to extend radially outwardly from said one side and being spaced axially from the other side of the outboard and inboard sides of said support member.

3,944,298

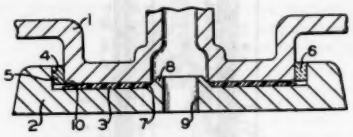
TRUCK BOLSTER CENTER BOWL WEAR PLATE

John G. Cannon, Penn Hills, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Feb. 24, 1975, Ser. No. 552,558
Int. Cl.² F16C 17/00, 19/00, 21/00; B61F 3/00
U.S. Cl. 308—137 **4 Claims**

1. In a vehicle, the combination comprising:

a. a truck bolster having therein a center bowl provided with an annular wall and a flat bottom from the center of which extends a boss,
b. a center plate vertical ring wear liner so disposed in said center bowl and fixedly secured to the annular wall thereof that the outer end of said center bowl and one end of said ring wear member lie in a common plane,
c. a vehicle body having a bolster of such a diameter as to extend through said ring wear member for disposition in



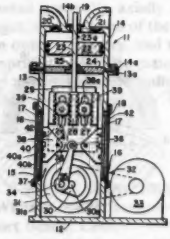
said center bowl, and wherein the improvement comprises:
d. an annular wear member formed of a low friction, semi-flexible, high-load-carrying ability, plastic material, and having an outside diameter the same as the inside diameter of said ring wear liner to enable the insertion thereof through said ring wear liner into surrounding relation with said boss of said center bowl for interposition between said flat bottom of said center bowl and said body bolster to support thereon said body bolster.

3,944,299

MACHINE BEARING CONSTRUCTION AND ARRANGEMENT

Anton Braun, 6421 Warren Ave., Minneapolis, Minn. 55435

Filed Feb. 21, 1975, Ser. No. 551,771
Int. Cl.² F16C *33/20*
U.S. Cl. 308—3 CH **12 Claims**



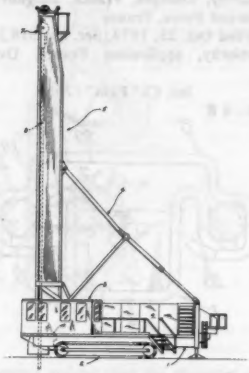
1. In a machine having a reciprocable member therein, a bearing for said member comprising a slidable member with pivot means disposed substantially centrally of its ends and having a bearing surface elongated in the direction it moves for engaging a mating fixed surface in the machine, said elongated surface having at least one transverse groove therein concentric with respect to a plane through the center of the pivot means and perpendicular to the bearing surface to cause the moments of force acting thereon about its pivot when in motion to cause the leading end thereof to tend to lift off of the mating surface.

3,944,300

RESILIENT GUIDE BUSHING MOUNTING FOR BLAST HOLE DRILLS OR THE LIKE

Tom Learmont, Wauwatosa; Jack D. Neimark, New Berlin; Gary E. Martin, South Milwaukee, and Theodore F. Raske, Germantown, all of Wis., assignors to Bucyrus-Erie Company, South Milwaukee, Wis.

Filed Feb. 26, 1975, Ser. No. 553,441
Int. Cl.² F16C *1/26*
U.S. Cl. 308—4 R **9 Claims**



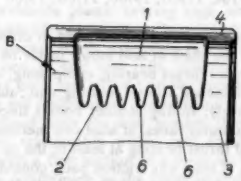
1. A mounting arrangement for the rigid tubular cylindrical guide bushing of a blast hole drill or the like, the bushing being disposed and laterally movable in a deck opening,
said mounting arrangement comprising:
a plurality of pads symmetrically spaced about the bushing, each pad including a radially inner rigid bearing member that bears against the side exterior surface of the bushing; a plurality of resilient, compressible cushion members, one cushion member being disposed adjacent and radially outwardly of each of said bearing members; and backup means adjacent and radially outward of the cushion members, lateral movement of the bushing against the bearing members causing the same to be moved radially outwardly to compress the respective cushion members, thus dampening such lateral movement.

3,944,301

LUBRICATING POCKET

Erich Roemer, c/o Gyco-Metall-Werke, Daelen and Loos GmbH, Wiesbaden-Schierstein, Germany

Filed Oct. 8, 1974, Ser. No. 513,143
Claims priority, application Germany, Oct. 20, 1973, 2352750
Int. Cl.² F16C *1/24*
U.S. Cl. 308—5 R **5 Claims**



1. A sliding bearing comprising a slide bearing surface over which a component is adapted to slide and wherein a lubricating oil reservoir and distribution pocket is recessed into the

slide bearing surface, characterized by a transition area between said pocket and said bearing surface with at least one extension of said pocket protruding into said bearing surface within said transition area to form a boundary edge of said pocket with respect to said bearing surface extending in a wavy line along said surface.

3,944,302

SLIDING RUNNERS, ESPECIALLY FOR SEATS IN VEHICLES

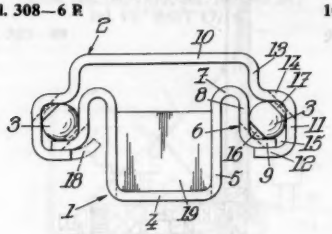
Francois Fourrey, Etampes, France, assignor to Etablissements Bertrand Faure, France

Filed Oct. 25, 1974, Ser. No. 518,184

Claims priority, application France, Oct. 31, 1973, 73.38916

Int. Cl.² F16C 17/00

U.S. Cl. 308—6 R **10 Claims**



1. A sliding runner comprising a first channel section member comprising a pair of flanks defining a channel therebetween, a second channel section member which comprises a base and a pair of flanks defining a channel therebetween and in which the first channel section member is fitted with the channel of one member open towards the base of the other, each flank of the first channel section member having a portion which extends backwardly in the direction away from the mouth of the channel towards the base of the first channel section member and then outwardly from the flank, the distal end of each flank of the second channel section member extending beyond the said outwardly extending portion of the adjacent flank of the first channel section member and inwardly along the rear face of said outwardly extending portion and forming with the opposed faces of the backwardly and outwardly extending portion of said adjacent flank an enclosure for a ball race, and a plurality of balls in each said enclosure facilitating sliding of said two members longitudinally relative to one another.

3,944,303

THRUST SUPPORT FOR A FLUID MOTOR USED IN DRILLING WELLS

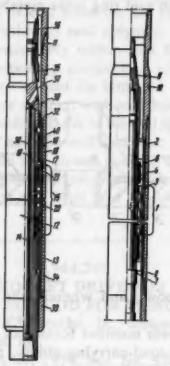
Jury Rolenovich Ioanesian, Matveevskaya ulitsa, 18, korpus 2, kv. 63, and Boris Vladimirovich Kuzin, Bulatnikovsky proezd, 10, korpus 3, kv. 499, both of Moscow, U.S.S.R.

Filed June 3, 1975, Ser. No. 583,450

Int. Cl.² F16C 17/00, 19/00, 21/00, 29/00

U.S. Cl. 308—6 A **1 Claim**

1. A thrust support for a fluid motor used in drilling wells, which is fitted onto the shaft of said motor inside its housing, having a rolling-contact thrust bearing, comprising: inner and outer races rigidly attached to said housing and said shaft of the motor, respectively; rolling-contact bodies disposed between said inner and outer races; at least one mechanical seal positioned near said thrust bearing at least at the op end face thereof, and having at least one friction pack consisting of an outer friction disc and an inner friction disc rigidly attached to said outer and inner races of the thrust bearing, respectively, and rigidly attached to said housing and said shaft of the motor, respectively; said arrangement working so that when said fluid motor is set in operation said shaft or housing starts spinning and imparts rotary motion to said inner or outer races of the thrust bearing and the inner or outer friction discs, whereas mud fed under a pressure equal to the bit differential pressure reaches said mechanical seal, but since said rotating races of the thrust bearing are rigidly attached to said rotating discs of the mechanical seal, these components take up the



hydraulic and drilling loads jointly with the result that the service life of said thrust support is extended and so is the period of continuous drilling of the well by means of said fluid motor which can successfully operate in conjunction with jet bits.

3,944,304

GAS-LUBRICATED SELF-PRESSURIZING RADIAL BEARING

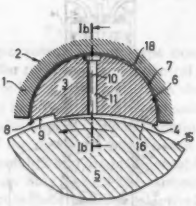
Werner Purtschert, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 10, 1974, Ser. No. 513,835

Claims priority, application Switzerland, Oct. 11, 1973, 14477/73

Int. Cl.² F16C 17/16

U.S. Cl. 308—9 **12 Claims**



1. In combination,

a housing having at least a recess therein;

a shaft rotatably mounted in said housing; and

a gas-lubricated self-pressurizing radial-bearing comprising a plurality of self-adjusting bearing segments, each said bearing segment being disposed in a respective recess for pivoting therein about an axis, each said bearing segment having a concave rotation ruled bearing surface facing said shaft and a convex rotation ruled bearing surface facing said recess, said bearing surfaces being asymmetrical relative to a plane passing through said axis and radially of said shaft, and at least one flow duct in said bearing segment communicating said bearing surfaces with each other.

3,944,305

ROLLER BEARING PROVIDED WITH FLANGES

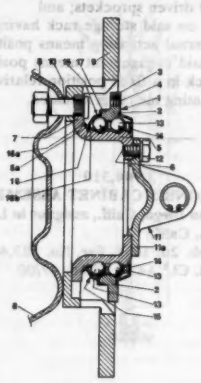
Sture Lennart Asberg, Goteborg, Sweden, assignor to SKF Nova AB, Goteborg, Sweden

Filed Apr. 9, 1973, Ser. No. 349,507

Claims priority, application Netherlands, Apr. 18, 1972, 7205167

Int. Cl.² F16C 33/78

U.S. Cl. 308—187.1 11 Claims



1. In a roller bearing including inner and outer rings with an annular space defined between said rings, the space and the rings having corresponding first and second ends, a plurality of roller elements in said space, and sealing means extending from one of said rings to the other for closing the roller elements within said two ends of said annular space, the improvement in combination therewith comprising first, second, and third flanges, wherein said first flange comprises a junction part adjacent the first end of said inner ring and an outer part extending generally radially outward from said junction part, said second flange extends generally radially inward from said second end of the inner ring, said third flange extends generally radially outward from said outer ring, with said roller elements being situated generally axially intermediate said first and second flanges, said first end of the outer ring formed as a collar having an outer periphery, and said sealing means of said first end comprising an elastic material having a relatively thickened part secured on said collar and a relatively thinner part extending to and engaging said inner ring in sliding contact.

3,944,306

ROCK BIT BEARING SEAL

William J. Neilson, Whittier, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Dec. 16, 1974, Ser. No. 533,271

Int. Cl.² F16C 33/78

U.S. Cl. 308—187.1 22 Claims

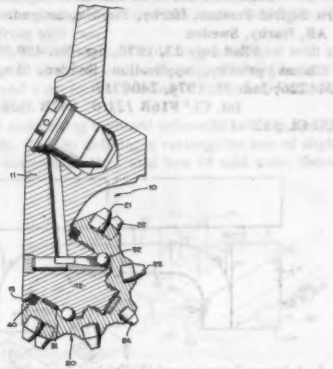
10. In a rock bit having a bit body with at least one journal leg, a seal between the journal leg and the rotary cutter, said seal comprising:

an annular metallic core;

inner and outer sealing ring portions of flexible material having elastomeric characteristics;

said sealing ring portions being disposed in opposite sides of said core, said inner ring portion having an annular engagement surface for a corresponding portion of the journal leg and said outer ring portion having an annular engagement surface for a corresponding portion of the cutter; and

each of said sealing ring portions being bonded to said core throughout substantially the entire circumference thereof, whereby said core maintains the dimensional stability of said sealing ring portions despite high levels of temperature and pressure to which said seal is subjected, said engagement surface for the journal leg having an



initial diameter greater than the diameter of the corresponding portion of the journal leg and said engagement surface for the cutter having a diameter greater than the diameter of the corresponding portion of the cutter whereby to compress said sealing ring portions between the journal leg and the cutter and in a direction transverse to the circumferential center line of said core.

3,944,307

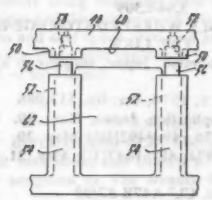
PLASTIC BEARING CAGE

Gerald L. Bingle, St. Clair Shores, Mich., assignor to Federal-Mogul Corporation, Detroit, Mich.

Filed Aug. 29, 1974, Ser. No. 501,515

Int. Cl.² F16C 13/00

U.S. Cl. 308—217 7 Claims



1. A weldable plastic bearing cage assembly which comprises a pair of annular side rails and a plurality of circumferentially spaced axially extending ribs affixed at one of their ends to one of said side rails, coacting means on the end portion of each said rib and on the opposed face of the adjacent side rail including an aperture and a cooperating projection disposed with the end portion thereof in interferring telescopic relationship within said aperture, said aperture formed with a first section of a cross sectional configuration generally conforming to the cross sectional configuration of the end portion of said projection and a second section inwardly spaced from said first section of a different cross sectional configuration and forming a shoulder at the intersection therebetween against which shoulder the end of said projection is disposed in abutting relationship, the end portion of

each said rib formed with a rib end face disposed in spaced substantially parallel relationship relative to the opposed face surface of the adjacent said side rail, the length of said projection being greater than the depth of said first section and less than the combined depth of said first and said second section.

3,944,308

FRAME FOR SUPPORTING ARTICLES

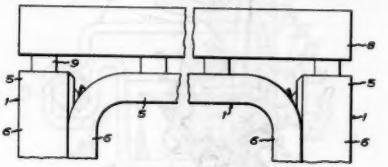
Eric Sigfrid Persson, Horby, Sweden, assignor to Expo Nord AB, Horby, Sweden

Filed July 23, 1974, Ser. No. 490,931

Claims priority, application Sweden, Aug. 17, 1973, 7311226; Jan. 21, 1974, 7400717

Int. Cl.² F16B *12/10*; A47B *3/06*

U.S. Cl. 312—111 10 Claims



1. A frame for supporting articles, comprising a plurality of bars forming a framework of open construction, means on said bars defining a channel which extends throughout the length of said bars and has a constricted channel side opening which opens into a side surface of said bars, said bars having angularly bent longitudinal portions and making angles with each other, some of said portions extending in touching contiguous relation, each pair of the contiguously extending bar portions turning their channel side openings towards one another, and locking means detachably introduced into the channels of each pair of the contiguously extending bar portions and engaging therein under locking action, said locking means extending through the channel side openings from channel to channel, whereby the frame may be readily assembled and disassembled and when assembled presents an appearance in which the locking means are not visible with these side openings in side-by-side alignment.

3,944,309

MANUALLY MOVABLE WHEELED STORAGE RACK OR THE LIKE

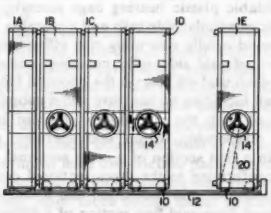
Genshi Taniwaki, Kumamoto, Japan, assignor to Kongo Co., Ltd., Japan

Filed Oct. 8, 1974, Ser. No. 513,086

Claims priority, application Japan, Nov. 30, 1973, 48-134543; Jan. 21, 1974, 49-9492[U]; May 29, 1974, 49-61448[U]; May 29, 1974, 48-61447[U]; Mar. 21, 1968, 43-22117[U]

Int. Cl.² A47B *87/00*

U.S. Cl. 312—198 9 Claims



1. A wheeled storage rack adapted for manual movement and locking, comprising:

a. a pair of rails;

b. a storage rack rollable on said rails and having a plurality of pairs of wheels with each pair having a connecting axle;

c. a handwheel with a shaft rotatably attached to one side wall of said storage rack;

d. a driving sprocket of predetermined diameter coaxially carried by the shaft of said handwheel;

e. a driven sprocket carried by one of said axles and having a diameter larger than said driving sprocket;

f. an endless power transmission chain connected between the driving and driven sprockets; and

g. locking means on said storage rack having engagement means and external actuating means positioned for human contact, said engagement means positively locking said storage rack in a fixed position relative to said rails when said actuating means is actuated.

3,944,310

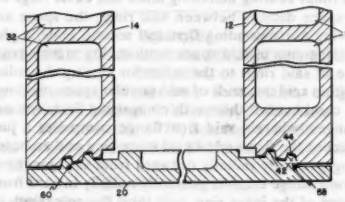
ELECTRONICS CABINET ASSEMBLY

James W. Welsh, San Diego, Calif., assignor to Langley Corporation, San Diego, Calif.

Filed Feb. 26, 1975, Ser. No. 553,447

Int. Cl.² A47B *43/00*, *47/00*

U.S. Cl. 312—263 8 Claims



1. A cabinet assembly comprising:

a pair of side panels,

said side panels being generally planar and adapted for vertically upright and parallel mounting,

said side panels being adapted to be secured together in spaced apart relationship by being secured through the upper and lower ends thereof,

said side panels having a mating surface along at least a portion of the forward facing edges thereof,

at least one generally planar front plate,

said front plate being adapted for extending between spaced side panels and having spaced mating surfaces adapted to cooperatively engage said mating surfaces on said side panels,

said mating surface collectively having a plurality of parallel elongated protrusions and alternate parallel channels,

said protrusions having sloping sides converging toward the outer portions of said protrusions,

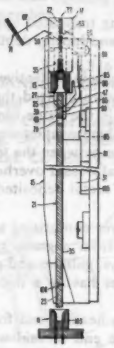
fastener means adapted for being received on said front plate and said side panels for drawing opposing protrusions and channels into a wedging interfitting engagement so that vibrationally induced shear forces are transferred between said front plates and said side panels through the engaged protrusions and channels.

3,944,311

PRINTED CIRCUIT CARD INTERFACE APPARATUS

George J. Sprenkle, Phoenixville, Pa., and David A. Cicero, Collingswood, N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sept. 4, 1974, Ser. No. 503,158
Int. Cl.² H01R 13/62
U.S. Cl. 339—45 M 13 Claims



1. A fixture for interfacing first and second sets of electrical leads with first and second opposite terminal edges, respectively, of a card bearing electrical circuitry, said fixture comprising:

first electrical connector means connected to said first set of leads for mating with said first terminal edge of said card;

second electrical connector means connected to said second set of leads for mating with said second terminal edge of said card;

frame means for receiving and slidably supporting said card between said first and second electrical connector means;

means supporting said second electrical connector means for movement along said frame means;

means on said frame means to guidingly support said supporting means for said second electrical connector means for movement along said frame means; and

actuatable means secured to said frame means and to said means supporting said second electrical connector means and movable in one direction for displacing said second electrical connector means in a first increment of movement to abut said card and move same along said frame means toward said first electrical connector means to cause a mating of said first electrical connector means and said first terminal edge, said actuatable means displacing said second electrical connector means in a second increment of movement to effect the mating of said second electrical connector means and said second terminal edge.

3,944,312

LOCKING DEVICE FOR SPADE-TYPE ELECTRICAL CONNECTORS

Thomas J. Koenig, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

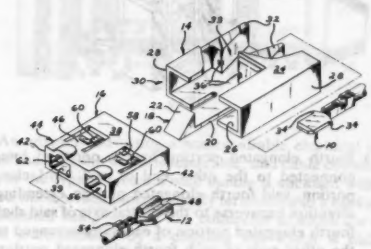
Filed Apr. 4, 1975, Ser. No. 565,201
Int. Cl.² H01R 13/42
U.S. Cl. 339—59 R 3 Claims

1. A locking device for maintaining electrical connection in spade-type connectors comprising:

a case and an insert, telescoping at least partially thereinto, both being interconnectable by a single, centrally-located attaching means, said case comprising opposed sidewalls and a top and bottom wall, thereby defining a rectangular box, said box containing upstanding wedges in opposed relationship to form a constriction; the distance between the wedges, when measured diagonally is greater than the width of the spade member of a spade connection, and the distance, when measured transversely, is less than the width of said spade member to thereby engage the rear edges of a spade member inserted into said case through a first end opening to prevent the spade member's withdrawal from said case;

said case further having a flexible tongue integral with said bottom wall at a first end, said tongue having located at its free end a projection forming a part of said attaching means; and

said insert comprising opposed sidewalls and top and bottom walls, thereby defining a rectangular box of slightly smaller dimensions than said box of said case, thereby



permitting said insert to be partially telescoped into said case, said insert further comprising inwardly projecting detents integral with the top wall thereof to engage a spade-receiving member of a spade connection inserted into said insert through a first end opening to likewise prevent its withdrawal from said insert, said insert further comprising a wall extending parallel to and equidistant from said opposed sidewalls to divide said insert into two compartments, each having one of said detents projecting from said top wall downwardly thereinto, said top wall further including an upwardly convoluted portion adjacent a first end to accommodate the connection of a wire to said spade-receiving member;

said insert being insertable into said case to cause said wedges and detents, respectively, to hold said spade portions and said spade-receiving portions in electrical connection when said projection is hooked behind said first end of said insert.

3,944,313

BIFURCATED ELECTRICAL CONTACT

James E. McKeown, and Donald E. Michel, both of Sidney, N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed July 31, 1974, Ser. No. 493,425
Int. Cl.² H01R 13/54
U.S. Cl. 339—75 MP 4 Claims

1. An electrical contact formed from sheet metal into a single unitary structure, said contact comprising:

a shaft having a central axis, a forward end, a rear end;

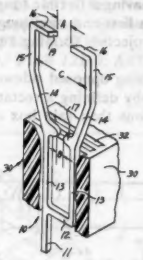
a first elongated member integrally connected to said shaft and extending transverse to the central axis of said shaft; and

a pair of resiliently deflectable arms arranged in spaced relationship about said central axis, said arms including:

a first elongated portion having one end integrally connected to said first elongated member, said first elongated portion extending in a direction away from said shaft and first member and parallel to the central axis of said shaft;

a second elongated portion having one end integrally connected to the other end of said first elongated portion, said second elongated portion extending in a direction away from said first member and at an angle to the central axis of said shaft;

a third elongated portion having one end integrally connected to the other end of said second elongated portion, said third elongated portion extending in a direction away from said shaft and first member and parallel to the central axis of said shaft; and



a fourth elongated portion having one end integrally connected to the other end of said third elongated portion, said fourth elongated portion extending in a direction transverse to the central axis of said shaft, the fourth elongated portion of each arm arranged so that the other ends of each fourth elongated portion face each other; and

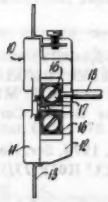
a first projection located at the junction between the first and second elongated portions of one of said arms and extending towards said other arm.

3,944,314

TERMINAL FOR ESTABLISHING A STABLE ELECTRICAL CONNECTION TO ALUMINUM WIRE

Milton J. Weitzman, Bayside, and Saul Rosenbaum, East Meadow, both of N.Y., assignors to Leviton Manufacturing Co., Inc., Brooklyn, N.Y.

Continuation of Ser. No. 262,648, June 14, 1972, abandoned.
This application Mar. 15, 1974, Ser. No. 451,610
Int. Cl.² H01R 9/08
U.S. Cl. 339—95 **5 Claims**



1. In a terminal for establishing a stable electrical connection between an electrical wiring device and a looped bare end of an aluminum wire ranging in size from No. 8 to No. 18 (AWG) and having an aluminum oxide film on said bare end in a branch wiring circuit which is capable of carrying substantial load currents without overheating, the combination comprising:

a. a terminal plate of electrically conductive material having an exposed wire-engaging surface and a screw threadably engaging with said plate in the midst of said surface for receiving said looped bare wire end;

b. said wire-engaging surface having on one side of said screw an area for receiving the terminating portion of said looped bare wire end and on the opposite side of said screw an area for receiving another portions of said looped bare wire end in a direction substantially parallel to said terminating portion;

c. at least said areas of said wire-engaging surface containing 50 to 100 serrations per inch positioned at a substantial angle to said direction for engagement with said looped bare end of said aluminum wire under pressure exerted on the wire;

d. said serrations having truncated upper ends terminating in sharp side edges and having depths of 0.001 to 0.005 of an inch;

e. said sharp side edges being effective when engaging with the wire under pressure exerted thereon for creating a multitude of breaks in the oxide film on the bare end of the wire and establishing contact sites permitting current flow at low resistance between the terminal plate and the wire to prevent the aforesaid overheating; and

f. a protective layer of metal deposited on said wire-engaging surface;

g. the metal of said layer comprising a flowable, soft metal and being selected from a group of metals comprising indium, indium alloys, gallium and gallium alloys;

h. said protective layer having a thickness of 0.00015 to 0.00025 of an inch,

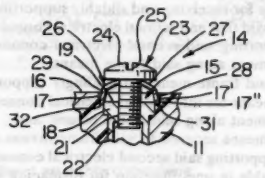
i. said screw having a headed end for engaging with and urging the said bare end of said wire into engagement with said serrations on the wire-engaging surface of said plate with the engagement being secure even if the torque acting on the screw is no more than six-inch pounds.

3,944,315

ELECTRICAL TERMINAL MEANS

Henry F. Hild, and John W. Stearley, both of Indiana, Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 10, 1974, Ser. No. 513,536
Int. Cl.² H01R 9/08, 9/10
U.S. Cl. 339—95 R **13 Claims**



1. In a control device having a housing provided with a terminal means having a threaded screw member with its shank threadedly carried thereby for lead attachment thereto between an enlarged head of the screw member and said terminal means, the improvement comprising a resilient retainer clip disposed between said head of said screw member and said terminal means, said clip having a portion provided with an opening therethrough and through which said shank of said screw member is telescopically disposed, a lead disposed between said portion of said clip and said terminal means, said portion of said clip being disposed in deformed condition against said lead by said head of said screw member to hold said lead to said terminal means, said clip having slot means passing through said portion thereof adjacent said opening to render said portion more deformable, said clip being in a substantially U-shape to define an initially bowed cross-member and a pair of legs thereof, said cross-member comprising said portion having said opening therethrough that telescopically receives said shank of said screw member, said legs of said U-shaped clip being disposed between said head

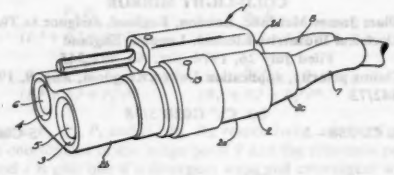
of said screw member and said terminal means and being disposed on opposite sides of said shank of said screw member, said lead being disposed between one of said legs of said U-shaped clip and said shank of said screw member, said opening being substantially in the center of said cross-member and circular in configuration and said slot means comprising at least one slot that passes through said cross-member and being substantially trapezoidal in configuration with the smaller base thereof interconnecting with said opening and the larger base thereof being located at said one leg whereby said slot extends from said opening to said one leg and passes through said cross-member.

3,944,316

ELECTRICAL CONNECTORS WITH KEYING MEANS

Albert P. Newman, and Victor L. Arrighi, both of c/o Empire Products, Inc. 10540 Chester Road, Cincinnati, Ohio 45215

Filed Aug. 26, 1974, Ser. No. 500,327
Int. Cl.² H01R *13/64*
U.S. Cl. 339—111 **6 Claims**



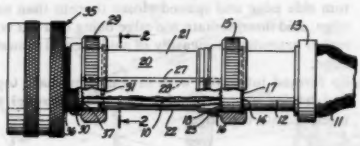
1. In an electrical connector assembly comprising a male connector with at least one male contact and a female connector with at least one female contact, said male and female connectors each terminating at least one electric cable and being adapted to be mated with said at least one male contact in engagement with said at least one female contact, the improvement comprising keying means in association with said male and female connectors enabling the mating of said male and female connectors with each other and preventing the mating of said male and female connectors with other similar female and male connectors and an electrical switch in association with said keying means, said keying means comprising a keying pin and mounting means therefor and an elongated member having a socket adapted to receive said keying pin, said mounting means for said keying pin comprising an elongated body, the longitudinal axis of said keying pin being parallel to and radially offset with respect to the longitudinal axis of said body, the longitudinal axis of said socket being parallel to and radially offset with respect to the longitudinal axis of said elongated member, said keying pin and said mounting means therefor being affixed to one of said male and female connectors with the axis of said keying pin being parallel to the axis of said at least one contact of said one of said male and female connectors, said elongated socket-bearing member being affixed to the other said male and female connectors with the axis of said socket being parallel to the axis of said at least one contact of said other of said male and female connectors, said mounting means for said keying pin being of hexagonal transverse cross section, said elongated socket-bearing member being of hexagonal transverse cross section, said keying pin mounting means being affixable to its respective connector in any one of six rotative positions about its longitudinal axis, said socket-bearing member also being affixable to its respective connector in any one of six corresponding rotative positions about its longitudinal axis, said radial offsets of said socket and said keying pin corresponding and said keying pin and mounting means therefor and said elongated socket-bearing element being so oriented on their respective connectors that said keying pin is receivable within said socket enabling mating of said male and female connectors and their respective male and female contacts, said switch mounted within said elongated socket-bearing member and means in association with said switch whereby said keying pin will activate said switch upon complete mating of said connectors and will deactivate siad switch when said connectors are disengaged.

3,944,317

ADAPTER FOR SHIELDED ELECTRICAL CABLE CONNECTIONS

Robert C. Oberdiear, Los Angeles, Calif., assignor to Amex Systems, Inc., Lawndale, Calif.

Filed Jan. 13, 1975, Ser. No. 540,591
Int. Cl.² H02G *15/08*
U.S. Cl. 339—143 R **1 Claim**



1. An adapter converting a non-repairable electrical cable connection into one which is repairable, said cable connection being of the type in which a wire bundle is enclosed within a braided shield which is permanently terminated to a backshell, the backshell being secured to a connector to which the wire bundle is terminated by a coupling nut which is slidably mounted on the backshell, the coupling nut having internal screw threading engaging external screw threading on the connector, the backshell having an outwardly directed annular shoulder, means carried by said coupling nut engaging said shoulder upon longitudinal movement of said coupling nut away from said backshell, said adapter comprising a pair of electrically conductive semicircular sections, said sections forming a cylindrical adapter fitting around and enclosing an unshielded portion of said wire bundle between said backshell and said connector, said adapter having diametrically enlarged external threading at one end thereof engaging said coupling nut connecting one end of said adapter to said backshell, a second coupling nut slidably mounted around said adapter, said second coupling nut having internal threading engaging the external threading on said connector connecting the other end of said adapter to said connector, the end of said adapter adjacent to said connector having an outwardly directed annular shoulder of identical dimension with said first named shoulder, a split ring mounted within said second coupling nut engaging said last named shoulder, said split ring being removable from said second coupling nut to permit said second coupling nut to be moved longitudinally past said diametrically enlarged external threading on said adapter and past said first named shoulder on said connector so that said sections can be separated and removed from around the unshielded portion of said wire bundle to permit repair of said bundle and its adjacent terminations to said connector without disturbing said shielding or the termination of said shielding to said backshell.

3,944,318

BATTERY POST AND CABLE CLAMP

William P. Backes, 2817 Grennell St., Peoria, Ill. 61605

Filed Dec. 2, 1974, Ser. No. 528,891
Int. Cl.² H01R *11/26*
U.S. Cl. 339—231 **3 Claims**

1. A battery post and cable clamp intended for securing a conductor cable to a conventional cylindrically configured battery post, the clamp device comprising, in combination:

a bottom clamp member of electrical conducting material;

a top clamp member of electrical conducting material;

means detachably affixing said top clamp member to said bottom clamp member in a hinge-like manner;

bolt means for adjustably affixing said top clamp member to said bottom clamp member;

a socket member formed integrally with said bottom clamp member and adapted to receive one end of said conductor cable therein to electrically connect the same to said bottom clamp member;

said bottom clamp member comprising, in combination:

a flat bottom edge;

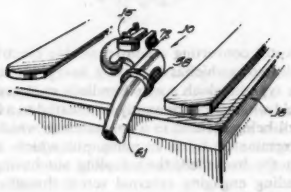
a first arcuate side edge;

a second arcuate side edge disposed spaced from said first side edge;

a flat top edge disposed adjacentmost said first side edge and extending parallel to said bottom edge;

an intermediate top edge extending parallel to said bottom side edge and spaced closer thereto than said top edge, said intermediate top edge being of a flat configuration extending outwardly of said second arcuate side edge;

a lip formed integrally with said intermediate top edge and having a bottom edge extending parallel to said intermediate top edge;



a bore extending through said lip;

an arcuate semi-circular exterior surface interconnecting the outermost end of said top edge to the outermost end of said first arcuate side edge;

a semi-circular recess interconnecting the innermost end of said top edge to the innermost end of said intermediate top edge, the semi-circular recess being of a size and configuration adapted to fit about the cylindrical side walls of a conventional battery post;

a cylindrical socket forming member having an open front end and a closed back end and cylindrical side walls formed integrally with said bottom edge of said bottom clamp member with said socket having its axis extending parallel thereto and opening out of said open end, said open end being adjacentmost said first arcuate side edge of said bottom clamp member;

a threaded aperture extending radially through a portion of said cylindrical side walls and opening into said socket; and

a bolt having a threaded shank threadedly received in said threaded aperture with the terminal end of the bolt adapted to pass into said socket for securing one end of said conductor cable in said socket.

3,944,319

ELECTRIC TERMINAL FITTING

Anthony J. Giampa, 8163 Rosewood, Los Angeles, Calif. 90048

Filed Sept. 9, 1974, Ser. No. 504,319

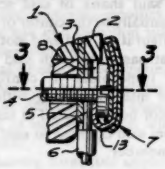
Int. Cl.² H01R 7/16

U.S. Cl. 339—269 **11 Claims**

1. An electric terminal fitting adapted to be interposed between a terminal plate and attaching screw to receive the stripped end of a conductor wire, said fitting comprising:

a. a slotted plate element for receiving the shank of an attaching screw;

b. at least one folded marginal element forming with the screw shank and plate element a guide passage dimensioned to receive an exposed conductor wire; the proportions of the guide passage being such as to clamp the wire upon tightening the screw;



c. and a tab element extending from the plate element and foldable over the head of the screw, the tab element having an insulating surface to guard against electrical contact with the head of the screw.

3,944,320

COLD-LIGHT MIRROR

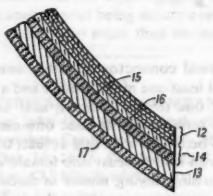
William James McLintic, London, England, assignor to Thorn Electrical Industries Limited, London, England

Filed July 26, 1974, Ser. No. 492,345

Claims priority, application United Kingdom, Aug. 9, 1973, 37842/73

Int. Cl.² G02B 5/28

U.S. Cl. 350—1 **5 Claims**



1. A cold-light mirror comprising a metal substrate having a front surface and a rear surface, a first pigmented vitreous coating on the front surface of said substrate and a second pigmented vitreous coating on the rear surface thereof, each of said pigmented vitreous coatings comprising a black vitreous enamel capable of absorbing infra-red radiation and having a smooth glazed surface, and a dielectric interference coating on the surface of said first pigmented vitreous coating for reflecting visible light and for transmitting infra-red radiation.

3,944,321

RECORDING UNIDIMENSIONAL HOLOGRAMS WITH REDUCED POSITIONAL SENSITIVITY DURING READOUT

Hartwig Ruell, Otterfing, and Eckhard Storck, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed Mar. 6, 1974, Ser. No. 448,497

Claims priority, application Germany, Mar. 30, 1973, 2316055

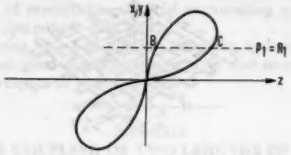
The portion of the term of this patent subsequent to May 7, 1991, has been disclaimed.

Int. Cl.² G03H 1/28

U.S. Cl. 350—3.5 **4 Claims**

1. A method for holographic recording of information received in the form of electrical signals wherein a coherent object wave pulse-modulated by the electrical signal interferes with a coherent reference wave to produce a unidimensional hologram upon a moving photosensitive storage medium wherein said coherent object wave and said coherent refer-

ence wave each have spherical wave fronts at the hologram storage medium, said object wave front having an origin at a point P and said reference wave front having an origin at a



point R wherein the reference wave source point R and object wave source point P are related by and lie on the following curve, defined by the following equations:

$$\frac{P_1 P_3}{(P_1^2 + P_2^2 + P_3^2)^{3/2}} + \epsilon \frac{R_1 R_3}{(R_1^2 + R_2^2 + R_3^2)^{3/2}} = 0$$

$$\frac{P_2 P_3}{(P_1^2 + P_2^2 + P_3^2)^{3/2}} + \epsilon \frac{R_2 R_3}{(R_1^2 + R_2^2 + R_3^2)^{3/2}} = 0$$

wherein P_1, P_2, P_3 and R_1, R_2, R_3, respectively, are the Cartesian coordinates of the image point P and the reference point R and ϵ is plus one if a divergent wave and convergent wave are being used and is minus one if both waves are divergent or both are convergent where the photosensitive storage medium being located on the "1–2 plane" and centered about the "3 axis".

3,944,322

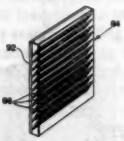
LIGHT FILTERING ARRANGEMENT FOR HOLOGRAPHIC DISPLAYS

Stephen A. Benton, Somerville, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 16, 1975, Ser. No. 541,608

Int. Cl.² G03H *1/22*

U.S. Cl. 350—3.5 **13 Claims**



1. Apparatus responsive to the light rays emanating from a light source for displaying images by the technique of wavefront reconstruction comprising:

a hologram; and

light filtering means directly adjacent said hologram and intermediate said hologram and light source for transmitting without substantial attenuation only light rays therethrough which are incident thereon at predetermined angles in order that the transmitted light rays be incident to said hologram only at angles within the range of angles required for substantial diffraction while at the same time substantially precluding the transmission therethrough of other light rays incident thereon at angles other than said predetermined angles of incidence, in this manner substantially blocking out such extraneous background light as may be attributable to the other light rays, wherein said light filtering means includes a plurality of spaced apart louvers angled to receive and transmit the light rays incident thereon at said predetermined angles while at the same time substantially precluding the transmission of other light rays incident thereon at angles other than said predetermined angles.

3,944,323

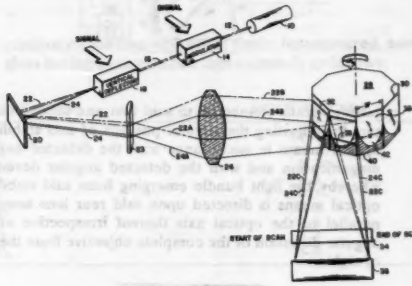
VARIABLE SPOT SIZE SCANNING SYSTEM

Gary K. Starkweather, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 23, 1974, Ser. No. 535,395

Int. Cl.² G02B *27/17*; H04N *5/84*, *3/00*

U.S. Cl. 350—7 **5 Claims**



1. An apparatus for recording information from an electrical signal onto a recording medium comprising: means for providing a beam of high intensity light, means for modulating the light beam in accordance with the information content of an electrical signal, a scanning mechanism having at least one reflecting surface rotatable about an axis in the path of said modulated beam for reflecting said beam, said reflecting surface having at least two portions arranged in an axial order, each of said portions being different in width from the other of said portions in a direction generally perpendicular to said axis, means for producing at said reflecting surface a beam width in said direction greater than the width of the portion with the minimum width, and means interposed between said modulating means and said scanning mechanism for selectively deflecting said modulated beam to any of said portions to control the amount of light reflected by said reflecting surface.

3,944,324

IMAGE STABILIZED ZOOM LENS SYSTEM

Akira Tajima, Kawasaki; Ryusho Hirose, Machida; Kazuya Hosoe, Machida; Hiroshi Furukawa, Tokyo, and Toshikazu Ichiyanagi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1974, Ser. No. 522,288

Claims priority, application Japan, Nov. 15, 1973, 48-128981

Int. Cl.² G02B *23/00*

U.S. Cl. 350—16 **7 Claims**

1. A zoom lens system with stabilized optical means comprising:

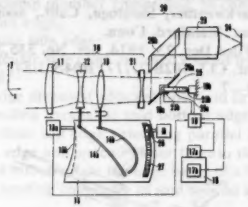
an image forming rear lens assembly;

an afocal front lens assembly which includes the members movable for zooming behind a front member which remains stationary during zooming, said front member being movable to effect focusing to suit different object positions, and the light rays emerging from said front lens assembly being almost parallel;

an image stabilizing mechanism which includes a stabilizing optical means arranged in the optical path between said front and rear lens assemblies;

a first detector responsive to the movement of said zooming members for detecting the angular magnification of said front lens assembly;

a second detector cooperating with inertial means for detecting the deviation angle of the complete system from a line of sight; and



adjusting means connected to said first and second detectors for adjusting the angular position of said stabilizing optical means in accordance with the detected angular magnification and with the detected angular deviation, whereby the light bundle emerging from said stabilized optical means is directed upon said rear lens assembly parallel to the optical axis thereof irrespective of the angular deviation of the complete objective from the line of sight.

3,944,325

SEMI-LIQUID STABILIZED OPTICES

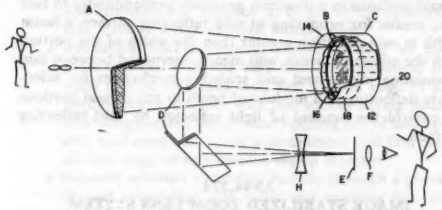
William E. Humphrey, Oakland, Calif., assignor to Optical Research and Development Corporation, Berkeley, Calif.

Continuation of Ser. No. 237,397, March 23, 1972, abandoned. This application Apr. 29, 1974, Ser. No. 465,044

The portion of the term of this patent subsequent to Jan. 16, 1990, has been disclaimed.

Int. Cl.² G02B *23/14*, *3/12*

U.S. Cl. 350—16 17 Claims



1. A stabilized optical apparatus comprising: a housing substantially filled with a transparent semi-liquid and having at least one transparent window; and an optical structure immersed in said semi-liquid, wherein said semi-liquid is a colloidal solution thickened by a high molecular weight thickener.

3,944,326

WAVEGUIDE

Maurus Tacke, Ratingen, and Reinhard Ulrich, Leonberg-Silberberg, both of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany

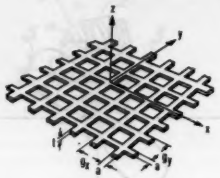
Filed Oct. 11, 1973, Ser. No. 405,323

Claims priority, application Germany, Oct. 17, 1972, 2250901

Int. Cl.² G02B *5/14*, *5/15*; H01P *3/10*

U.S. Cl. 350—96 WG 13 Claims

1. Waveguide for radiated electromagnetic waves in the submillimeter and infrared range, comprising means defining a waveguide surface for propagating a TM wave having an at least singly periodic two-dimensional sheet form grating made



of electrically conducting material with at least a grating constant

$$\left(\frac{1}{g_x 2} + \frac{1}{g_y 2}\right) > \left(\frac{2}{\lambda}\right)^2$$

where λ is the wavelength of an electromagnetic wave of the radiated frequency propagating freely in the surrounding medium to be transmitted along the surface of the waveguide and g_x and g_y are finite grating constants of the grating defining finite periodicity in each of nonparallel x and y directions respectively,

and means for directing a wave onto said waveguide surface such that a TM wave having said wavelength λ is propagated along the surface of the waveguide.

3,944,327

CONNECTION BETWEEN TWO LIGHT CONDUCTING GLASS FIBERS

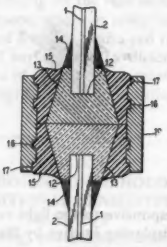
Herbert Larsen, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation-in-part of Ser. No. 261,943, June 12, 1972, abandoned. This application May 9, 1974, Ser. No. 468,256

Claims priority, application Germany, July 14, 1971, 2135254

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96 C 5 Claims



1. A connecting means for glass fibers comprising,

a first core glass fiber,

a second core glass fiber,

coating glass surrounding each core glass fiber and forming a sheath therefor,

a conical glass component part for each glass fiber having a recess in the small diameter end of said conical glass component part for receiving the core glass fiber and coating glass to extend generally along the axis of said conical glass component part,

each conical glass component part having a refractive index profile in which the periphery of the recess radially to the outer surface of the conical glass component part has the same refractive index as the coating glass forming a sheath for the core glass fiber, and the region of the

conical glass component part extending from the inner end of the recess to the large diameter end of the conical glass component part has the same refractive index extending in an axial direction as the core glass fiber, and slopes constantly down in all directions toward the conical sheathing surface of the conical glass component part,

a mass of machinable material surrounding each conical glass component part, and

a centering ring surrounding the mass and retaining the conical glass components parts in end-to-end relation with respect to each other.

3,944,328

IN-LINE COUPLING OF TWO LENGTHS OF LINEAR OPTICAL WAVEGUIDE ELEMENTS

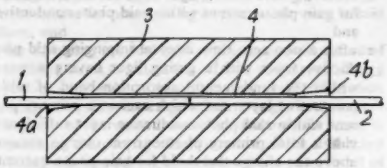
Alan Hugh Kent, Wokingham, and Peter Howard Fell, Maidenhead, both of England, assignors to Plessey Handel und Investments AG., Zug, Switzerland

Filed Aug. 8, 1974, Ser. No. 495,913

Claims priority, application United Kingdom, Sept. 1, 1973, 41236/73

Int. Cl.² G02B 5/14

U.S. Cl. 350—96 C **7 Claims**



1. A method of establishing the in-line coupling of two optical waveguide elements of the same cross-section, which comprises the steps of (a) producing a block of epoxy-resin material having a through bore whose cross-section corresponds to that of the said waveguide elements but is slightly larger in its dimensions so that the elements are a sliding fit in the through bore, the through bore being flared at each end to provide a lead-in portion, by a process which includes: providing a mould having a mould cavity through which a tensioned wire whose surface does not adhere to the epoxy-resin material, extends from end to end of the cavity; filling this cavity with epoxy-resin moulding material and allowing the material to set; and withdrawing the wire longitudinally and removing the moulded resin body from the mould, and (b) inserting the two waveguide elements into the trough bore from the two ends thereof respectively to abut end-to-end at or near the centre of the through bore.

3,944,329

FARADAY ROTATOR DEVICE INCLUDING LITHIA-SILICATE GLASS ARTICLES CONTAINING TB_2O_3 AND METHODS OF USING SAME

Haynes A. Lee, Jr., Sylvania, and Charles F. Rapp, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 318,805, Dec. 27, 1972. This application Sept. 16, 1974, Ser. No. 505,900

Int. Cl.² G02B 5/30; C09K 11/08; C03C 3/04; G02F 1/09

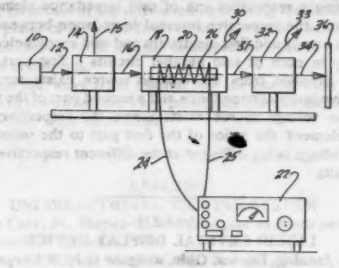
U.S. Cl. 350—151 **22 Claims**

1. A Faraday rotator device comprising

1. means for supplying polarized electromagnetic radiation,

2. a glass article capable of effecting Faraday rotation when subjected to a magnetic field, and

3. magnetic means for inducing a magnetic field in the glass article for rotating the polarized electromagnetic radiation within the glass, said glass article having a high Verdet constant, having good light transmission, having good melt properties, having a high damage threshold, having good forming properties including a relatively wide working temperature at approximately log 4 viscosity, being



relatively seed-free and being easily homogenized, said glass having a composition approximately as follows:

INGREDIENTS	MOLE PERCENT
SiO_2	61–80
Li_2O	15–27.5
Na_2O	0–10
K_2O	0–5
CaO	0–5
Al_2O_3	0–3
B_2O_3	0–3
La_2O_3	0–3
Tb_2O_3	3–9

wherein the sum of $Li_2O + Na_2O + K_2O + CaO$ is no greater than about 32.5 mole percent.

3,944,330

ELECTRO-OPTIC DEVICE

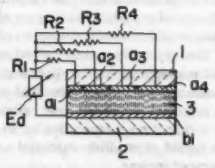
Ichiro Tsunoda; Satoshi Takeuchi, both of Kawasaki; Yoichiro Hirao, Tokyo; Takeo Suzuki, Tokyo; Yoshihiro Nishiue, Tokyo; Katsumasa Tadokoro, Tokyo; Toshimasa Fukagawa, Tokyo; Isamu Harada, Warabi; Akira Misawa, and Kazuo Watanabe, both of Tokyo, all of Japan, assignors to Dainippon Printing Co., Ltd., Tokyo, Japan

Filed Sept. 21, 1973, Ser. No. 399,481

Claims priority, application Japan, Sept. 22, 1972, 47-95497; Oct. 6, 1972, 47-100394; Oct. 6, 1972, 47-100395; Nov. 18, 1972, 47-115880; Jan. 25, 1973, 48-11406[U]; Feb. 10, 1973, 48-16941; Feb. 22, 1973, 48-21640

Int. Cl.² G02F 1/13

U.S. Cl. 350—160 LC **4 Claims**



1. An electro-optic device comprising a first transparent substrate, a second substrate juxtaposed to the first substrate, a body of electro-optically variable liquid disposed between said substrates, a plurality of first electrodes disposed on the surface of the first substrate facing the second substrate, each individual one of said plurality of first electrodes having an area different from the area of the others, a second electrode provided on the surface of the second substrate facing the first substrate, said liquid interposing internal impedance between said first electrodes and said second electrode, and a plurality of impedance elements of equal impedance value, external to said substrates and liquid; each of said first electrodes being connected through a respective one of said impedance elements to a terminal of a voltage source, and said second elec-

trode being connected to another terminal of the voltage source, so that there are a plurality of parallel circuits each comprising a respective one of said impedance elements in series with the respective internal impedance between a respective one of said first electrodes and said second electrode, whereby in each of said parallel circuits a first part of the voltage supplied from the voltage source exists across the respective internal impedance and a second part of the voltage from the voltage source exists across the respective impedance element, the ratios of the first part to the second part of the voltage being different at the different respective parallel circuits.

3,944,331

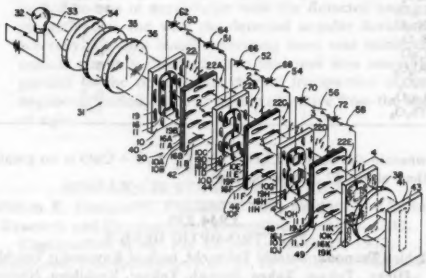
LIQUID CRYSTAL DISPLAY DEVICE

John L. Janning, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 306,352, Nov. 13, 1972, abandoned. This application Sept. 5, 1974, Ser. No. 503,235

Int. Cl.² G02F 1/13

U.S. Cl. 350—160 LC **7 Claims**



1. A liquid crystal display device, comprising:

a. a plurality of transparent support panels positioned in spaced parallel planes along a common axis to form a plurality of discrete cells;

b. a transparent electrode film coated on adjacent facing surfaces of the support panels, each electrode film conforming to a particular different character; and

c. a plurality of alignment means deposited on respective electrode films in a direction which makes an acute angle with respect to the surfaces of the support panels;

d. the alignment means arranged in alternately displaced directions of alignment about the common axis whereby when liquid crystal material, having an elongated crystalline structure, is added to the discrete cells, the longitudinal axis of the crystalline material adjacent each alignment means is oriented in the direction of the adjacent alignment means and the longitudinal axis of the liquid crystalline material adjacent one alignment means is oriented in a direction perpendicular to the longitudinal axes of the liquid crystalline material adjacent the next facing alignment means.

3,944,332

OPTICAL SENSITIZATION AND DEVELOPMENT OF LIQUID CRYSTALLINE DEVICES

Simpei Tutihasi, and Kyler F. Nelson, both of Pittsford, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed July 17, 1974, Ser. No. 489,954

Int. Cl.² G02F 1/13

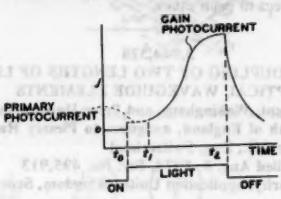
U.S. Cl. 350—160 LC **30 Claims**

1. A method of changing at least one characteristic of a layer of liquid crystalline composition, said characteristic being responsive to applied voltage, comprising:

a. providing a sandwiched structure comprising, in turn, a first electrode, an insulating layer, a photoconductive layer, said layer of liquid crystalline composition, and a second electrode; the thickness ratio of said photoconductive layer to said insulating layer being at least about 10 to 1;

b. applying a D.C. voltage across said insulating, photoconductive and liquid crystalline layers;

c. impinging said photoconductive layer with biasing light having a wavelength within the fundamental absorption band of said photoconductive layer wherein a primary photocurrent is excited with said photoconductive layer;



d. removing said biasing light at about the charge threshold for gain photocurrent within said photoconductive layer; and

e. after a non-zero time interval impinging said photoconductive layer with a gating light having a wavelength within the fundamental absorption band of said photoconductive layer and which excites a primary photocurrent within said photoconductive layer sufficient to provide a total primary photocurrent charge accumulation above the charge threshold for gain photo current within said photoconductive layer.

3,944,333

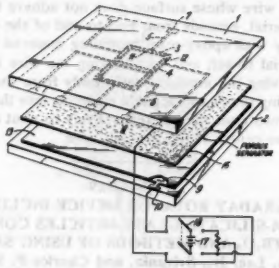
ELECTROCHROMIC DISPLAY WITH POROUS SEPARATOR

Marshall Leibowitz, Englewood, N.J., assignor to Timex Corporation, Waterbury, Conn.

Filed Jan. 13, 1975, Ser. No. 540,481

Int. Cl.² G02F 1/36

U.S. Cl. 350—160 R **9 Claims**



1. In an electrochromic display of the type having a first substrate with selectively actuatable transparent electrodes and first electrochromic layers thereon, and also having a second substrate with counter-electrode and second electrochromic layer thereon, the improvement comprising:

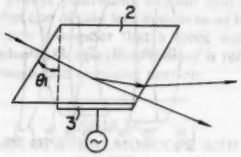
porous separator means applied as a layer and uniformly and closely spacing said first and second substrate members, the pores of said separator means being filled with liquid electrolyte, and

pigment means held by said separator means and selected to provide contrast with said first electrochromic layers and disposed to hide said second electrochromic layer.

3,944,334
ACOUSTO-OPTIC FILTER

Tsutomu Yano, and Akinori Watanabe, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Company, Ltd., Osaka, Japan

Filed Aug. 27, 1974, Ser. No. 500,887
Claims priority, application Japan, Aug. 30, 1973, 48-97979
Int. Cl.² G02F 1/34
U.S. Cl. 350—161 6 Claims

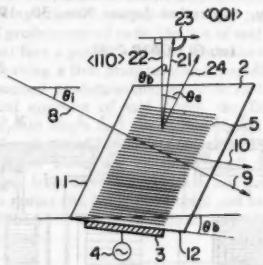


1. An acousto-optic filter comprising:
a medium in which light has two different phase velocities in a propagating direction, said medium having entrance and exit surfaces for light rays,
transducer means for propagating an ultrasonic wave in said medium, and
means for directing a light beam to the entrance surface of said medium so as to cause far-off-axis anisotropic Bragg diffraction with said ultrasonic wave, said diffraction occurring at a relatively large incident angle with respect to the plane of the wave front of said ultrasonic wave in said medium, the propagation direction of the diffracted light being displaced from the plane of the wave front of said ultrasonic wave in the same direction as that of undiffracted light to produce optical filtering,
the entrance surface of said medium being slanted by a predetermined angle from the plane normal to the wave front of the ultrasonic wave.

3,944,335
ACOUSTO-OPTIC FILTER

Koetsu Saito; Tsutomu Yano, and Akinori Watanabe, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Company, Ltd., Osaka, Japan

Filed Aug. 27, 1974, Ser. No. 500,886
Claims priority, application Japan, Dec. 14, 1973, 48-140616
Int. Cl.² G02F 1/34
U.S. Cl. 350—161 5 Claims

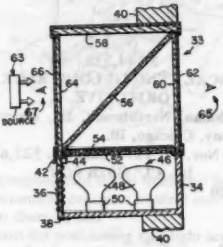


1. An acousto-optic filter comprising:
an acousto-optic medium in which light has two different phase velocities in a propagating direction,
transducer means for propagating an ultrasonic wave in said medium, and
means for directing a light beam to said medium so as to cause far-off-axis anisotropic Bragg diffraction with said ultrasonic wave, said diffraction occurring at a relatively large indicent angle with respect to the plane of the wave front of said ultrasonic wave in said medium, the propagation direction of the diffracted light being displaced from the plane of the wave front of said ultrasonic wave in the same direction as that of undiffracted light to produce optical filtering,
wherein the wave front normal and the energy flow direction of the ultrasonic wave propagating in the medium are different from each other.

3,944,336
UNI-DIRECTIONAL VIEWING SYSTEM

W. John Carr, Jr., Hayward, Wis., assignor to Electron Optics Corporation, Hayward, Wis.

Filed July 12, 1974, Ser. No. 487,582
Int. Cl.² G02B 27/14, 5/08
U.S. Cl. 350—174 11 Claims



1. An optical system for viewing a subject by a viewer, the viewer being optically concealed from the subject, said system comprising:
a. an eye port through which the viewer looks;
b. a viewing port for observing the subject;
c. source means for generating light, said source means including masking means having randomly distributed shading;
d. light absorbing means;
e. means for partially reflecting and partially transmitting said light generated by said source means, said partially reflecting and partially transmitting means interposed between said source means and said light absorbing means;
f. said partially reflecting and partially transmitting means disposed in a plane that is oblique with respect to a path along which said light is directed from said source means, said plane of said partially reflecting and partially transmitting means being such that light is directed towards said viewing port, the viewer looking into said eye port views the subject, the subject looking into said viewing port observes said light, said light absorbing means operative to prevent said light from being reflected towards the viewer, said masking means operative to camouflage the viewer and his surrounding area.

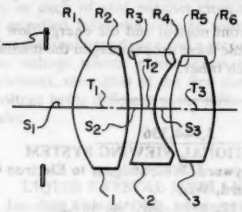
3,944,337
THREE ELEMENT OBJECTIVE LENS WITH ELLIPSOIDAL, HYPERBOLIC, AND PARABOLIC SURFACES

Paul Lewis Ruben, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 18, 1974, Ser. No. 516,235
Int. Cl.² B29D 13/18; G02B 3/04, 9/14
U.S. Cl. 350—189 6 Claims

1. A three element objective lens comprising a front positive biconvex element having two aspheric surfaces, a middle

negative biconcave element having two aspheric surfaces and a rear positive biconvex element wherein said aspheric surfaces are from front to rear, an ellipsoid, a hyperboloid, and two paraboloids.

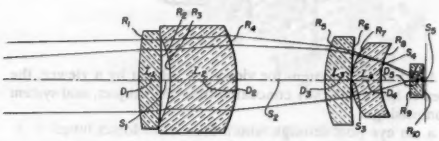


3,944,338

SHORT FOCAL LENGTH LONG BACK FOCUS OBJECTIVE

Andor A. Fleischman, Northbrook, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Nov. 11, 1974, Ser. No. 522,655
Int. Cl.² G02B 9/34
U.S. Cl. 350—220 **2 Claims**



1. An optical system of relatively short focal length and large aperture having a relatively long back focus and substantially the following specification:

EFL = 8.17mm(.3215 inch)
½ Angle of Field = 2.58°

LENS	RADII (IN.)	THICKNESS (IN.)	SPACING (IN.)
L_1	R_1 = .8800 R_2 = 15.4000	D_1 = .0750	
			S_1 = .0350
L_2	R_3 = −.3370 R_4 = .4120	D_2 = .2230	
			S_2 = .3100
L_3	R_5 = .4310 R_6 = −6.6720	D_3 = .0960	
			S_3 = .0040
L_4	R_7 = .1750 R_8 = −.2450	D_4 = .0940	
			S_4 = .1000 (.1545 BFL)
L_5	R_9 = Inf. R_{10} = Inf.	D_5 = .0492	
			0 S_5 .0053

For ELEMENTS L_1, L_3 V = 25.4 N_D = 1.805
For ELEMENTS L_2, L_4 V = 66.1 N_D = 1.494
ELEMENT L_4 — OPTICAL MATERIAL

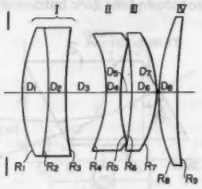
wherein the first column lists the lens elements numerically starting at the ray entrance side of the system which elements each have the dispersive index V and the refractive index N_D; the second column lists the respective base radii R_1 to R_{10}; the third column lists the thickness D_1 to D_5 of the respective elements; and the fourth column lists the axial spacings S_1 to S_5 between the respective elements, and the image plane.

3,944,339

LARGE APERTURE PHOTOGRAPHIC OBJECTIVE

Kikuo Momiyama, Chofu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 3, 1974, Ser. No. 485,555
Claims priority, application Japan, July 7, 1973, 48-76162
Int. Cl.² G02B 9/34
U.S. Cl. 350—220 **4 Claims**



1. A large aperture photographic objective lens system adapted for use with a diaphragm located forwardly thereof, said objective comprising in order from the object side:

a first positive meniscus doublet lens component which is convex toward the object side and is composed of a double convex lens and a double concave lens cemented together at their adjoining surfaces;

a second double concave single lens component a strong concave curvature directed forwardly toward the object side and being rearwardly spaced from said first component;

a third positive meniscus singlet lens component which is convex toward the image side and lying substantially in edge contact with said second component; and

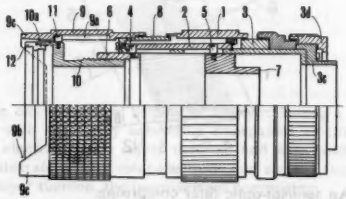
a fourth convex singlet lens component having a refracting surface of strong convex curvature directed toward the object side and being spaced from said third component; said refracting surface of strong convex curvature of the fourth component being flatter than the adjacent surface of said third component; and the axial length from the first surface of said first component to the first surface of said second component being longer than the axial length from the second surface of said second component to the second surface of said third component.

3,944,340

LENS BARREL FOR A CAMERA

Shigeru Hashimoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1974, Ser. No. 527,207
Claims priority, application Japan, Nov. 30, 1973, 48-135598
Int. Cl.² G02B 7/02
U.S. Cl. 350—255 **5 Claims**



1. A lens barrel for the lens system of a camera, said lens system including an optical axis and a front end, said lens barrel comprising a fixed barrel for mounting upon said camera, a lens frame having a lens mounted thereon disposed at said front end of said lens system and being movable within said fixed barrel in the direction of said optical axis, an opera-

tion means capable of revolving about said fixed barrel to effect displacement of said lens frame, a cam groove and a pin engaged within said cam groove, said pin and cam groove operatively interposed between said operation means and said movable lens frame to effect movement of said lens frame when said operation means is revolved about said fixed barrel, a cylindrical member, and an engaging portion, said cylindrical member being rotatably engaged upon the circumference of said fixed barrel by said engaging portion, said cylindrical member being configured to form a mantle member of said lens barrel, said lens barrel being configured with said cylindrical member always protruding beyond said movable lens frame at said front end of said lens system so as to protect said lens frame in such a manner that a force exerted on said cylindrical member from exteriorly thereof is received by said fixed barrel through said engaging portion.

3,944,341

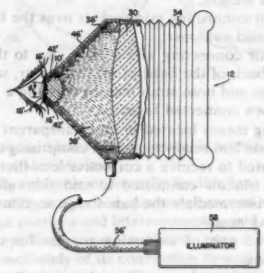
WIDE-ANGLE OPHTHALMOSCOPE AND FUNDUS CAMERA

Oleg Pomerantzeff, Brookline, Mass., assignor to Retina Foundation, Boston, Mass.

Continuation-in-part of Ser. No. 292,150, Sept. 25, 1972. This application Oct. 4, 1974, Ser. No. 512,327

Int. Cl.² A61B *3/14*

U.S. Cl. 351—7 **21 Claims**



1. An ophthalmoscope comprising a contact lens through which the interior of the eye can be viewed, said contact lens being surrounded by arrays of optical fibers to form an inside ring of optical fibers and an outside ring of optical fibers spaced apart from said inside ring, said contact lens having a configuration which enables it to be placed on a cornea, said fibers being oriented in a predetermined position to form said rings of predetermined radii, the tips of said fibers forming the rings that face a patient's cornea when the ophthalmoscope is in use making a first predetermined angle in said inside ring and a second predetermined angle in said outside ring, the numerical aperture of said fibers, the first predetermined angle of said fibers and the radius of said inside ring being selected so that said inside ring illuminates the central part of the field and leaves the entrance pupil of the observation system free from direct illumination, said second ring of fibers having a radius and being positioned and angled to illuminate the periphery of the field without directly illuminating the entrance pupil.

3,944,342

PHOTOGRAPHIC APPARATUS FOR SLIT LAMP

Miguel Martinez, Baltimore, Md., assignor to Codman & Shurtleff, Inc., Randolph, Mass.

Filed Apr. 30, 1974, Ser. No. 465,589

Int. Cl.² A61B *3/14*

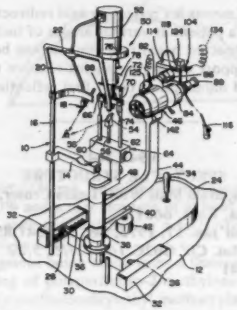
U.S. Cl. 351—14 **20 Claims**

1. In combination with an opthalmic slit lamp device having a binocular microscope, an apparatus for photographing an object through said microscope, comprising:

photographic camera means having an automatic exposure control mechanism and a focusing lens;

adapter means for mounting said photographic camera means on the ocular of the microscope, wherein said camera means is supported before said ocular via its focusing lens;

light sensing means for providing a signal representative of light sensed thereby;



means for coupling said signal from said light sensing means to said automatic exposure control mechanism to control operation thereof; and

mounting means for positioning said light sensing means adjacent the objective of the microscope whereby said automatic exposure control mechanism is operated in response to light at the objective of the microscope while the image to be photographed is transmitted through the microscope to said photographic camera means.

3,944,343

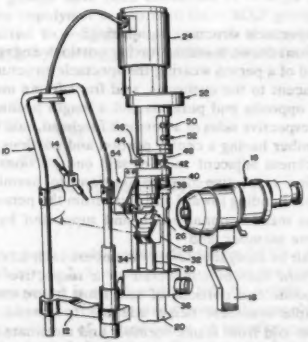
LIGHT INCLINING ACCESSORY FOR SLIT LAMP

Werner Mueller, Jr., North Easton, Mass., assignor to Codman & Shurtleff, Inc., Randolph, Mass.

Filed Aug. 16, 1974, Ser. No. 498,238

Int. Cl.² A61B *3/10*; G02B *5/08*

U.S. Cl. 351—16 **22 Claims**



1. A light inclining accessory of an ophthalmologic slit lamp having an illumination column providing an essentially vertical illumination beam from an end thereof, a support spaced from that end of the illumination column, and a binocular microscope for viewing a patient's eye, said accessory comprising:

first means adapted to be mounted on said support for reflecting said illumination beam essentially into the horizontal, said means accomplishing said reflection without converging or diverging the rays of said beam;

means for intercepting and redirecting said illumination beam, said intercepting and redirecting means being selectively positionable between said illumination column and said illumination beam first reflecting means, said intercepting and redirecting means being adjustable to selectively redirect said beam at one of various angles; and

a plurality of means for reflecting said redirected beam into the eye of a patient at various angles of inclination, each of said redirected beam reflecting means being mounted on said support at varying angles relative to each other and to said illumination beam first reflecting means.

3,944,344

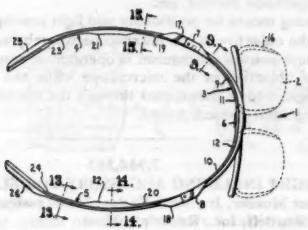
SPECTACLE STRUCTURE

Max F. Wichers, Main Mall White Lakes Center, 3630 Topeka Blvd., Topeka, Kans. 66611

Filed Jan. 17, 1975, Ser. No. 541,857

Int. Cl.² G02C *1/02, 5/16, 5/22*

U.S. Cl. 351—41 **11 Claims**



1. A spectacle structure comprising:

a. a front frame member having portions engaging a forehead of a person wearing the spectacle structure at a level adjacent to the eyebrows, said front frame member having opposite end portions and a length positioning same at respective sides of a person's forehead, said front frame member having a center portion and portions of reduced thickness adjacent each of said end portions thereof to define respective flexible portions to permit unidirectional bending toward and away from the person's head;

b. lens means connected to and supported by said front frame member; and

c. a pair of elongated temple members each having one end portion thereof connected to a respective one of the opposite end portions of said front frame member, said temple members being adapted to extend rearwardly from said front frame member and terminate in rear free end portions, said temple members each having a center portion and first and second portions of reduced thickness adjacent the center portion thereof to define respective flexible portions to permit unidirectional bending toward and away from the person's head, whereby said front frame member and said temple members conform to and exert inwardly directed pressure on a person's head to support the spectacle structure thereon.

3,944,345

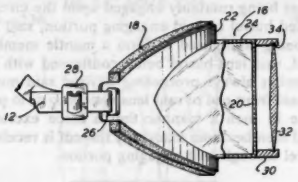
OPTICALLY CORRECTED SWIMMING GOGGLES

Frank Decorato, 60 E. 96th St., New York, N.Y. 10028

Filed June 6, 1974, Ser. No. 476,970

Int. Cl.² G02C *1/00*

U.S. Cl. 351—43 **5 Claims**



1. An improved pair of swimming goggles for use by a swimmer including:

a pair of plastic eye sockets, each socket including a flange base section roughly shaped to fit the contour of a swimmer's eye, a sidewall section connected to said flange base section and extending outward therefrom roughly parallel to the direction to the line of sight of said swimmer, and a transparent sidewall extension extending from said sidewall section;

a nose strap for connecting said sockets over the bridge of the nose of said swimmer;

a head strap for connecting said sockets one to the other around the back of the head of said swimmer, said head strap, sockets and nose strap thereby forming a continuous loop when connected together;

a lens receiving means located in said transparent sidewall extension, said lens receiving means comprising a snap-in groove adapted to receive a corrective lens therein; and

a transparent window connected to said sidewall section and located intermediate the base flange section and said lens receiving means.

5. An improved pair of swimming goggles for use by a swimmer including:

a pair of plastic eye sockets, each socket including a flange base section roughly shaped to fit the contour of a swimmer's eye, a sidewall section connected to said flange base section and extending outwardly therefrom roughly parallel to the direction of the line of sight of said swimmer, and a transparent sidewall extension extending from said sidewall section;

a nose strap for connecting said sockets over the bridge of the nose of said swimmer;

a head strap for connecting said sockets one to the other around the back of the head of said swimmer, said head strap, sockets and nose strap thereby forming a continuous loop when connected together;

a lens receiving means located in said transparent sidewall extension and comprising a flat ledge recessed into said sidewall extension and adapted to receive said corrective lens, said corrective lens being securable into said sidewall extension by a cement-type material; and,

a transparent window connected to said sidewall section and located intermediate the base flange section and said lens receiving means.

3,944,346

POLARIZING SPECTACLES

Anthony Shindler, Brookline, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Nov. 20, 1974, Ser. No. 525,542

Int. Cl.² G02C *7/12*; **G02B** *5/30*

U.S. Cl. 351—49 **8 Claims**

1. In polarizing spectacles having a frame front comprising a pair of right and left eye variable density dual lens systems,

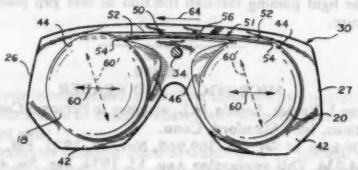
a nose engaging bridge portion and rearwardly directed temples for supporting the spectacles before the eyes of a wearer, the improvement comprising:

said frame front including readily separable juxtapositioned forward and rear lens supporting sections each having a pair of lens rims interconnected by a bridge portion for supporting right and left eye light-polarizing lenses, said sections being correspondingly face-formed by a bend in said bridge portions;

means for releasably fastening said lens supporting sections together;

a first of said sections of said frame front fixedly supporting a first right and a first left eye light-polarizing lens, said first right and left eye lenses having their respective axes of polarization aligned in a common direction;

the second of said sections of said frame front supporting a second right and a second left eye lens each juxtapositioned with a corresponding one of said first right and first left eye lenses when said sections are fastened together,



said second lenses being rotatable within said rims of said second section; and

manually operable universally flexible lens actuating means extending across said spectacles around said bend in said bridge portions and interconnecting said second right and left eye lenses, said actuating means having a handle intermediately of its connection to said second lenses for manually selectively effecting lateral movement thereof to simultaneously equally rotate said second lenses relative to said first lenses and thereby simultaneously identically vary the density to light of said right and left eye dual lens systems, said flexibility of said lens actuating means lending it readily conformable in shape to said face-form bend of said frame front throughout all ranges of said manual movement whereby said second right and left eye lens rotation may be effected smoothly, with ease with accurate duplication of the extent of rotation of each of said second lenses to afford accurate duplication of optical density of said right and left eye dual lens systems at all times.

3,944,347

CONTACT LENS HAVING A HARD CENTER AND SOFT, TOUGH PERIPHERY

Archie E. Barkdoll, Hockessin, and David C. England, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 152,075, June 11, 1971, abandoned. This application Feb. 26, 1974, Ser. No. 445,915

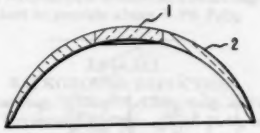
Int. Cl.² G02C 7/04

U.S. Cl. 351—160 **33 Claims**

1. A wettable, transparent segmented contact lens for the eye consisting of fluorine-containing polymers and having a concavo-convex structure with the concave surface conforming substantially to the shape of the eye surface,

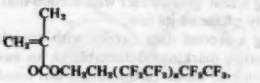
a central segment defining an optical zone composed of a hard, stiff fluoropolymer of a Knoop hardness of at least 2.0 and

a peripheral segment composed of a soft, tough fluoropolymer having a Clash-Berg torsion modulus in the range of about 95 to about 1000 lb/sq.in., a Shore Durometer (A) hardness of 90 or less, a tensile strength (break) of at



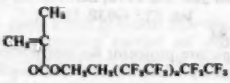
least about 100 psi, an elongation (break) of at least about 160% and a tear strength of at least about 5 lb/linear inch; each segment having a refractive index in the range 1.30 to 1.40;

the central segment being made from a fluoropolymer of the group consisting of polyperfluoro-2-methylene-4-methyl-1,3-dioxolane; poly(perfluoroalkylethyl methacrylate) of the monomeric formula



wherein $n = 1, 2, 3, 4$ and 5;

copolymer of perfluoro-2-methylene-4-methyl-1,3-dioxolane and tetrafluoroethylene; copolymer of perfluoro-2-methylene-4-methyl-1,3-dioxolane and vinylidene fluoride; copolymer of hexafluoroacetone, tetrafluoroethylene and ethylene; copolymer of tetrafluoroethylene, perfluoro-2-methylene-4-methyl-1,3-dioxolane and perfluoro(propyl vinyl ether); copolymer of tetrafluoroethylene and perfluoro[2(2-fluorosulfonylethoxy) propyl vinyl ether] in which all the $-SO_2F$ groups have been converted to $-SO_3H$ groups; the same copolymer in which all the $-SO_2F$ groups have been converted to $-SO_3K$ groups; and the same copolymer in which all the $-SO_2F$ groups have been converted to $-SO_3NH_4$ groups; and a copolymer of perfluoroalkylethyl methacrylates of the monomeric formula (A)



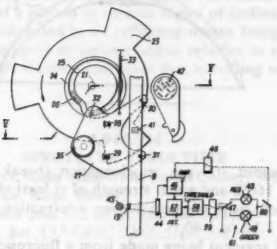
with one or more vinyl compounds wherein (A) is a mixture in which $n = 1, 2, 3, 4$, and 5 and wherein the content of vinyl compound is no more than 20% by weight; and

the peripheral segment being made from a fluoropolymer of the group consisting of a copolymer of tetrafluoroethylene and perfluoro(methyl vinyl ether); the same copolymer plasticized with polyperfluoropropylene oxide oil; a copolymer of tetrafluoroethylene, perfluoro(methyl vinyl ether) and vinylidene fluoride; a copolymer of tetrafluoroethylene and perfluoro[2(2-fluorosulfonylethoxy)propyl vinyl ether]; a copolymer of vinylidene fluoride, hexafluoropropylene and tetrafluoroethylene; and a copolymer of vinylidene fluoride and hexafluoropropylene.

3,944,348
METHOD OF AND MEANS FOR CHECKING THE CORRELATION OF TWO DATA CARRIERS

Otto Freudenschuss, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Nov. 8, 1973, Ser. No. 414,071
Claims priority, application Austria, Nov. 14, 1972, 9659/72
Int. Cl.² G03B 31/00
U.S. Cl. 352—5 10 Claims



1. A method of checking the correlation of two independently driven data carriers to be run at the same time, comprising the steps of:

providing a first data carrier with a code mark detectable in an early phase of its run;

providing a second data carrier with correlation and non-correlation markings detectable in an early phase of its run with one mode of operation but nondetectable with another mode of operation;

starting the run of both data carriers substantially concurrently, with said second data carrier in its other mode of operation preventing detection of either of said markings thereon;

upon detecting said code mark on said first data carrier, switching said second data carrier to said one mode of operation for detecting the markings thereon; and

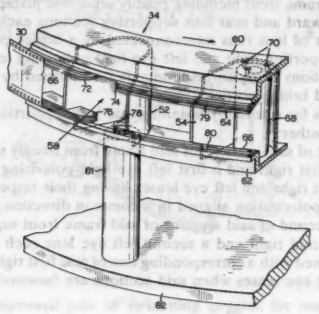
continuing the run of said data carriers only upon detection of a correlation marking on said second data carrier immediately after switching to said one mode of operation.

3,944,349
SHUTTER ASSEMBLY

Peter Ronald Wright Jones, Brisbane, Australia, assignor to Multiscreen Corporation Limited and Eclair Corporation of America

Filed Jan. 16, 1970, Ser. No. 3,543
Int. Cl.² G03B 1/00
U.S. Cl. 352—184 2 Claims

1. A motion picture projector for intermittently transporting a film through a predetermined frame length in relation to a projection aperture and for projecting said film at said aperture, said projector comprising: a stator, a rotor co-operating with said stator to define a passage for said film, said rotor having gaps for receiving film loops; an inlet in said stator through which said film is fed into said passage; an outlet in said stator through which said film is withdrawn from said passage, said aperture being intermediate said inlet and said outlet; film moving means for feeding said film into said inlet at a controlled speed relative to the speed of said rotor and for withdrawal of said film from said outlet at said controlled speed; film locating means for co-operating with said film moving means for gradually increasing and then gradually decreasing said film loop in said gap and for intermittently holding said film in fixed position in registration with said aperture; light source means for directing light through said aperture to project said film; and at least one primary shutter coupled to said rotor, said primary shutter comprising a curved plate bridging a gap, whereby said primary shutter cuts

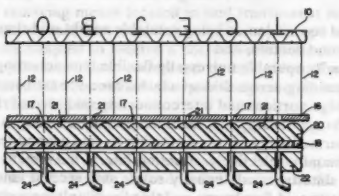


off the light passing through the film as said gap passes said aperture.

3,944,350
MICROFICHE AND READER

George J. Yevick, Leonia, N.J., assignor to Personal Communications, Inc., Stamford, Conn.

Division of Ser. No. 309,968, Nov. 28, 1972, Pat. No. 3,864,034. This application Aug. 13, 1974, Ser. No. 497,084
Int. Cl.² G03B 23/08
U.S. Cl. 353—27 R 7 Claims



1. A microfiche reader for projecting and viewing micro optic information, including,

a. a viewing screen,

b. an apertured mask spaced from said screen and parallel thereto,

c. means for supporting a microfiche having optically active elements, said microfiche being parallel to said viewing screen and spaced therefrom,

d. means to illuminate said microfiche and project micro images thereon through said mask apertures and thence onto said viewing screen,

e. means for preventing overlapping of projected micro images on said screen, said means defined by opaque septa positioned between said screen and said apertured mask.

3,944,351
APPARATUS FOR SUPERIMPOSING A PLURALITY OF IMAGES

Yuji Ito, Tokyo, and Nori Kato, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1974, Ser. No. 445,883
Claims priority, application Japan, Mar. 2, 1973, 48-24355
Int. Cl.² G03B 21/10
U.S. Cl. 353—31 1 Claim

1. An apparatus for projecting a plurality of pictures on a single screen by a plurality of projection lenses, comprising:

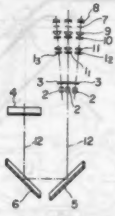
a horizontal surface and a slanted surface with respect to said horizontal surface and a screen being disposed in said slanted surface;

a first standard axis perpendicularly passing through the center of said screen;

a second standard axis perpendicularly passing through said horizontal surface;

a plurality of projection lenses each having an optical axis parallel with said second standard axis, and being so positioned as to surround the second standard axis portion above the said horizontal surface;

a plurality of mirror members being provided below said planar members for aligning the first standard axis with the second standard axis so that a light ray incident to said



mirror members along said first standard axis would be so deflected as to emerge coincident with the second standard axis;

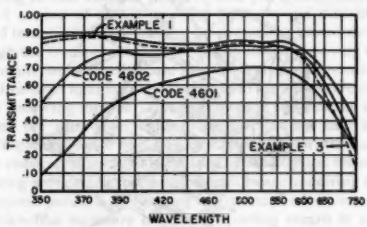
a plurality of pictures, each of which is perpendicular to an optical axis of one of said projection lenses, thus being parallel with the screen; and

a plurality of illumination optical systems to illuminate each of said pictures, each said illumination system having lens means to form an image of a filament at a pupil position of a corresponding projection lens, the optical axis of each said lens means being slanted with respect to the optical axis of a corresponding projection lens and passing through the center of the projection lens and the center of the screen.

3,944,352
HEAT ABSORBING GLASSES

David W. Morgan, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed June 17, 1974, Ser. No. 480,108
Int. Cl.² G03B *21/18*; C03C *3/00*
U.S. Cl. 353—55 5 Claims



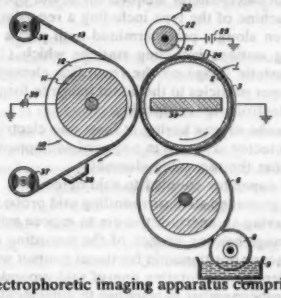
1. A batch for a heat absorbing glass exhibiting very good transmittance in the visible portion of the radiation spectrum and having a strain point higher than 560°C. consisting essentially, by weight on the oxide basis, of about 0.5–3% FeO, 0.5–3% R_2O, wherein R_2O consists of Li_2O, Na_2O, and/or K_2O, 12–16% Al_2O_3, 10–30% SiO_2, and 50–65% P_2O_5, wherein $NH_4H_2PO_4$ is utilized as a batch ingredient in an amount sufficient to provide about 1–9% P_2O_5.

4. In a light image projection apparatus, wherein said image is produced by passing light through a film, comprising a light source and a glass element designed to transmit light to said film and to protect said film from the heat generated by said light source, the improvement which comprises utilizing as said glass element a heat absorbing glass exhibiting very good transmittance in the visible portion of the spectrum, having a strain point higher than 560°C. and being made from a batch consisting essentially, by weight on the oxide basis, of about 0.5–3% FeO, 0.5–3% R_2O, wherein R_2O consists of Li_2O, Na_2O, and/or K_2O, 12–16% Al_2O_3, 10–30% SiO_2, and 50–65% P_2O_5, wherein $NH_4H_2PO_4$ is utilized as a batch ingredient in an amount sufficient to provide about 1–9% P_2O_5.

3,944,353
BACKGROUND REDUCTION

Christopher Snelling; William S. Little, both of Penfield, and Robert H. Townsend, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 206,467, Dec. 6, 1971, Pat. No. 3,737,310, which is a continuation of Ser. No. 863,608, Oct. 3, 1969, abandoned. This application Mar. 1, 1973, Ser. No. 337,247
The portion of the term of this patent subsequent to Feb. 29, 1989, has been disclaimed.
Int. Cl.² G03G *15/22*
U.S. Cl. 355—3 P 12 Claims



1. A photoelectrophoretic imaging apparatus comprising in combination:

a. an optically transparent first electrode having a surface capable of supporting a layer of imaging suspension thereon;

b. means for introducing a layer of imaging suspension to the surface of said first electrode;

c. a second electrode mounted in close proximity to said first electrode so as to make contact with a surface of a layer of imaging suspension carried on said first electrode surface thereby defining a nip having an air gap on each side thereof;

d. means to apply a first potential difference across a layer of imaging suspension carried on said first electrode surface between said first electrode and said second electrode;

e. a third electrode mounted in close proximity to said first electrode so as to make contact with a surface of a layer of imaging suspension carried on said first electrode surface thereby defining a nip having an air gap on each side thereof;

f. means to expose with actinic electromagnetic radiation of an image to be reproduced, that portion of a layer of imaging suspension at an area of closest proximity of said third electrode and said first electrode;

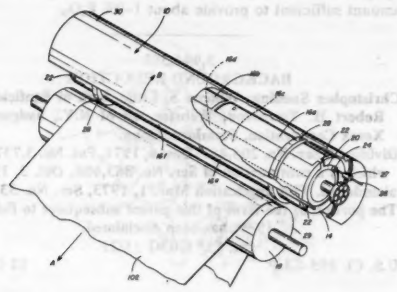
g. means to apply a second potential difference across a layer of imaging suspension carried on said first electrode surface, between said third electrode and said first electrode during said exposure; and

h. means to cause relative movement between said first electrode and said second and third electrodes.

3,944,354
VOLTAGE MEASUREMENT APPARATUS

Bruce R. Benwood, Spencerport, and Howard D. Siebenrock, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 6, 1974, Ser. No. 503,996
Int. Cl.² G03G 15/00
U.S. Cl. 355—3 R 6 Claims



1. An electrometer adapted for in situ operation in a copying machine of the type including a recording element which is driven along a predetermined path past a plurality of processing stations including stations which (1) form a latent electrostatic image on the recording element and (2) apply developer particles to the latent image to form a visible image, said electrometer comprising:

a. probe means having at least one electrically conducting detector arranged in a spaced and noncontacting manner from the recording element;

b. a capacitor coupled to said detector;

c. a grounded shell surrounding said probe means, said shell having an aperture therein to expose said detector to the image bearing surface of the recording element;

d. means positioned in frictional contact with the recording element for rotating one of said grounded shell and said probe member in response to movement of the recording element whereby said detector charges said capacitor upon exposure to the recording element to a voltage level which is a function of the surface voltage of the recording element and discharges said capacitor upon exposure to said grounded shell to produce an a.c. voltage on said capacitor;

e. circuit means coupled to said capacitor for determining the envelope of said a.c. voltage and for producing a differential d.c. control voltage signal representative of the surface voltage on the recording element; and

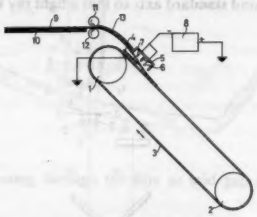
f. means for applying said control signal to at least one processing station of the copying machine.

3,944,355
APPARATUS FOR TRANSPORTING AND CHARGING PAPER IN ELECTROSTATIC COPIERS AND THE LIKE

Josef Matkan, Malvern, Australia, assignor to Research Laboratories of Australia, Eastwood, Australia

Filed Apr. 4, 1974, Ser. No. 457,724
Claims priority, application Australia, Apr. 9, 1973, 2930/73
Int. Cl.² G03G 15/02
U.S. Cl. 355—3 R 3 Claims

1. In a copying apparatus wherein an electrostatically chargeable endless belt made of electrically insulative material is trained over a pair of spaced rollers to provide a run forming a flat focal plane defining an exposure zone and wherein means are provided to feed an uncharged photoconductive recording member, having a sensitive side and a non-sensitive side, onto said belt for transport to said exposure zone, means for charging said photoconductive recording member simultaneously with adhering said non-sensitive side of said photoconductive recording member onto said insulative belt, by an electrostatic surface charge applied to the belt, said charging means being a single electrical couple which itself consists essentially of (1) a corona generating means, juxtaposed closely adjacent said insulative endless belt in position to charge the belt and (2) an electrode positioned between said insulative endless belt and the feed path of said photoconductive recording member, said electrode being

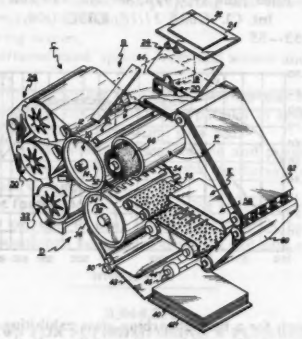


positioned in virtual contact with said insulative endless belt on the same side of the belt as said corona generating means and extending transverse to the direction of movement of said endless belt, said electrode further being positioned in the feed path of the recording member to contact said non-sensitive side of said photoconductive recording member before said non-sensitive side of said photoconductive recording member is fed on to said insulative endless belt, said corona generating means and the electrode being the sole means for both charging the belt and the recording member simultaneously.

3,944,356
CHARGING APPARATUS

Thomas F. Hayne, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 29, 1974, Ser. No. 501,543
Int. Cl.² G03G 15/00
U.S. Cl. 355—3 R 19 Claims



1. An apparatus for forming a charged area on an image bearing member corresponding substantially in size to the surface area of a sheet of support material arranged to have a copy of an original document reproduced thereon, including:

means for detecting the size of the surface area of the sheet of support material;

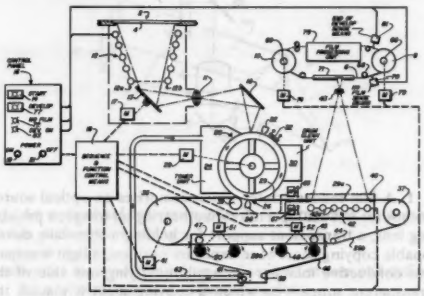
means for charging the image bearing member to a substantially uniform level; and

means, responsive to said detecting means, for controlling said charging means so that the charged surface area of the image bearing member corresponds substantially in size to the surface area of the sheet of support material.

3,944,357
MICROFILM MAKING APPARATUS

Harvey H. Wacks, Southfield, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed May 14, 1973, Ser. No. 359,717
Int. Cl.² G03G *15/00*
U.S. Cl. 355—5 **8 Claims**

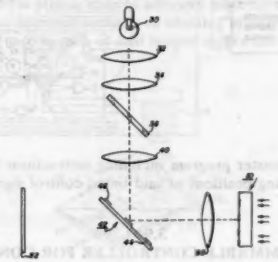


1. In combination with xerographic apparatus including means for providing printed document differentially reflected light containing the information to be microfilmed and xerographic image producing means including an initially charged photoconductive surface in the path of said printed document differentially reflected light on which surface a pattern of uncharged areas is produced in response to the pattern of said energy impinging thereon, the improvement comprising apparatus for producing original microfilm on a microform film structure insensitive relative to silver halide films to energy which differentially reflects off of the light and dark areas of a printed document and relatively sensitive to ultraviolet light, said apparatus comprising: an image receiving member transparent to ultraviolet light; image developing means responsive to the pattern of charged areas on said photoconductive surface for providing on said image receiving member a coating of particles opaque to said ultraviolet light in a pattern corresponding to said charged areas on said photoconductive surface; a source of said ultraviolet light on one side of said coated image receiving member for projecting ultraviolet light through the transparent portion of said image receiving member; means for supporting said microfilm structure sensitive to said ultraviolet light in spaced relation to the other side of said image receiving member; image reduction lens means in the path of the ultraviolet light projected through said image receiving member for focusing on said microfilm structure an image reduced by a factor of at least about 20; first means for imparting motion intermittently to said image receiving member; second means for providing intermittent advancement of said microfilm structure on said supporting means in accordance with the spacing between successive exposure frames; a control station including a manually operable start means; sequence and function control means responsive to operation of said manually operable start means for initiating the momentary operation of said image producing means, first means which imparts motion to said image receiving member to move the image containing portion of said image receiving member to said image projection station, said source of ultraviolet light to project the image on said image projection member through said image reduction lens means and upon said microfilm structure, and said second means to impart advancement of said microfilm structure one frame position to bring an unexposed frame of said film into an exposure position.

3,944,358
COLOR IMAGE REPRODUCTION SYSTEM

Richard F. Bergen, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 20, 1974, Ser. No. 507,909
Int. Cl.² G03G *15/00*
U.S. Cl. 355—9 **12 Claims**



1. A color optical reproduction system comprising arranged along an optical path

an extended light source;

means for generating a plurality of point light sources;

means to project images of said point light sources at an image plane;

means located at the image plane of said point light sources for folding said optical path to direct light from said point sources to a deformation imaging member;

a deformation imaging member bearing multicolor information, said information comprising at least two images superimposed over each other, said images being in the form of surface deformation phase gratings arranged at different angular orientations and corresponding respectively to the color content of different colors of an original multicolor image; and

light filter means for selectively transmitting to an output image plane the color content of the multicolor original image corresponding to the images recorded by the imaging member, wherein said light filter means and means for folding the optical path are parts of the same integral member.

3,944,359
PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES

Bernard C. Fisk, Dallas, Tex.; Gerald C. VerSchage, Henrietta, N.Y., and James M. Donohue, Los Alamitos, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 12, 1974, Ser. No. 496,664
Int. Cl.² G03G *15/00*
U.S. Cl. 355—14 **3 Claims**

1. In a system responsive to externally applied control signals for making reproduction of originals the combination of:

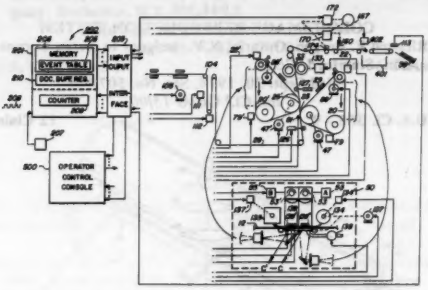
a. a series of electrostatic processing stations adapted when actuated in proper timed sequence to form an operable reproduction apparatus capable of making reproductions electrostatically; and

b. a computer for controlling actuating of said processing stations in proper timed sequence to provide said operable reproduction apparatus, said computer including:

a programmable memory adapted to retain a master operating program for said apparatus,

said computer being adapted to calculate in accordance with said externally applied control signals said master program timed control signals; and

control means responsive to said timed control signals for actuating said processing stations and render the apparatus operative to make reproductions,

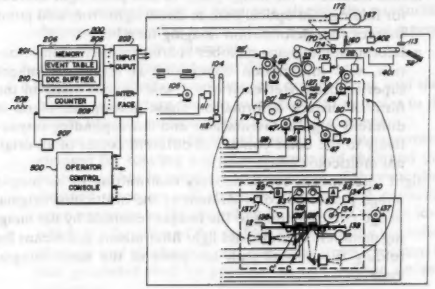


said master program including instructions for changing timing positions of said timed control signals.

3,944,360
PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES

David R. Deetz; Bernard C. Fisk, both of Dallas, Tex.; Gerald C. VerSchage, Henrietta, N.Y., and James M. Donohue, Los Alamitos, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 12, 1974, Ser. No. 496,665
Int. Cl.² G03G *15/00*
U.S. Cl. 355—14 7 Claims



1. A reproduction system for producing copies of an original, comprising:

a reproduction machine including a plurality of control devices for implementing the copying process events,

means for inputting a reproduction run instruction of predetermined characteristics for the reproduction run,

a programmable controller having means responsive to the run instruction and means for storing an control program for operating the machine, said controller being operable by said control program to derive timed control signals related to the reproduction run of said predetermined characteristics and applying said control signals to said plurality of control devices for implementing the copying process steps whereby the machine is enabled to make copies according to the reproduction instruction,

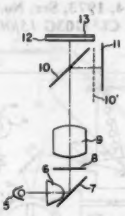
said reproduction system including a web copy material supply, means for feeding the web as copy material, and means for sensing an undesirable portion of the web,

said control program having an instruction routine for enabling said controller to generate timed control signals to actuate said implementing devices selectively to avoid processing on the undesirable portion of the web material.

3,944,361
COPYING DEVICE

Mutsuhiro Tnoue, Sagamihara, and Ryoichi Konishi, Tokyo, both of Japan, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 294,933, Oct. 4, 1972, abandoned.
This application July 29, 1974, Ser. No. 492,983
Claims priority, application Japan, Oct. 5, 1971, 46-78509[U]
Int. Cl.² G03B *27/32*
U.S. Cl. 355—27 5 Claims

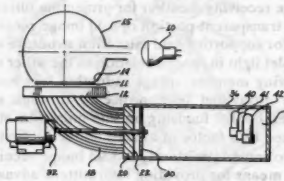


1. A film reader printer which comprises an optical source means for irradiating a microfilm bearing an image, a projecting lens, a transparent support for holding a thermally developable copying sheet at an exposure position, a light transparent conductive member uniformly overlying one side of the transparent support on which a copying sheet is placed, the transparent support being a glass plate and the light transparent conductive member being made of tin oxide, electrodes connected to the light transparent conductive member capable of applying voltage to the light transparent conductive member, said conductive member generating heat by the flow of electric current to thereby heat the copying sheet, a screen for observing an image of the film projected by the projecting lens, a reflecting mirror movable on a light path of the projecting lens, and the reflecting mirror projecting a light image passing through the projecting lens to the screen.

3,944,362
METHOD AND APPARATUS FOR DETERMINING THE TIME INTENSITY INTEGRAL OF THE EXPOSURE OF A NEGATIVE ONTO PHOTOGRAPHIC PAPER

John L. Dailey, 119 E. McKinley, Tempe, Ariz. 85281

Filed Sept. 24, 1974, Ser. No. 509,018
Int. Cl.² G03B *27/78*
U.S. Cl. 355—38 23 Claims



1. The method of forming a color print from a color negative by controlling the time intensity integral of the exposure comprising the steps of:

a. scanning said negative by directing light therethrough at a plurality of discrete areas;

b. detecting the light transmitted through said discrete areas of said negative in each of the colors red, green and blue;

c. determining for each of said colors the fraction of the total area of the negative to be printed which has a transmissivity on a linear scale greater than the mean transmissivity of the same area; and

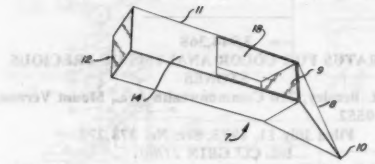
d. setting the time intensity integral of the exposure in each of said colors proportional to the fraction of area having a transmissivity greater than the mean transmissivity for that color.

3,944,363

FOCUSING DEVICE AND METHOD OF USE THEREOF FOR PHOTOGRAPHIC ENLARGER

Robert W. Mitchell, St. Joseph, Mich., assignor to Photo Systems, Inc., Dexter, Mich.

Filed Sept. 19, 1974, Ser. No. 507,397
Int. Cl.² G03B 27/70
U.S. Cl. 355—60 **11 Claims**



1. An optical aid for viewing an image projected on a projection surface comprising:

support means;

reflective means mounted on said support means and defining a generally planar reflective surface,

reference means defining a reference point spaced from said reflective surface a predetermined distance and lying generally along a reference axis passing through a central portion of said reflective surface and forming a predetermined angle relative thereto,

and a viewing surface secured to said support means generally normal to a viewing axis extending between said viewing surface and a central portion of said reflective surface, and the angle of said viewing axis to said reflective surface being substantially equal to said predetermined angle,

said reference point being adapted for engagement with said projection surface and said support means being freely movable to establish any desired angle between said reference axis and said projection surface.

7. A method of using a focusing device to focus a photographic enlarger comprising an enlarging lens, an easel, a light source and a photographic negative positioned between said light source and said enlarging lens comprising the steps of:

a. placing one end of said focusing device at any point of the surface of said easel,

b. while maintaining the point of contact established in step (a) moving the angular position with respect to said easel of said focusing device until said focusing device forms a symmetrical shadow with the point of contact between said focusing device and said easel as a center point,

c. viewing said photographic negative as an image generated by said focusing device,

d. adjusting the distance between said photographic negative and said enlarging lens until the image viewed in step (c) is of any desired clarity.

3,944,364

BORDERLESS PRINTING EASEL

Richard R. Petrini, 237 Wall St., and Dorin F. Van Lue, 1080 Essex St., both of Livermore, Calif. 94550

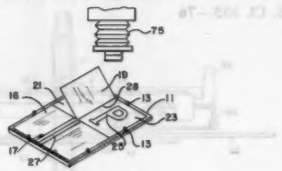
Filed July 24, 1974, Ser. No. 491,299
Int. Cl.² G03B 27/58
U.S. Cl. 355—74 **6 Claims**

6. A borderless printing easel for minimizing paper waste during the production of one or a multiple of borderless prints comprising

a flat base block having a plurality of border alignment members projecting therefrom which are suitably arranged to form an 8 × 10 inch rectangular retaining border,

a flat transparent cover removably positionable over an 8 × 10 inch sheet of printing paper held within said alignment members,

a set of interchangeable flat sectioned mask plates removably positionable over said transparent cover within said retaining border, said mask plates having hinged portions generally in the center of said plates for forming individual maks sections of each plate, said hinge portions being formed by a pliable strip of adhesive material adapted to adhere to adjacent surfaces of abutting masking sections whereby one section of said hinged masks can be folded



back flat up against the top of adjacent sections to produce a straight unobstructed border at the hinged edge, said set of mask plates comprising

one 8 × 10 inch plate having two 5 × 8 inch foldable mask sections for producing standard 5 × 7 inch prints,

two 5 × 8 inch plates each having two 4 × 5 inch adjacent foldable mask sections for producing standard 4 × 5 inch prints,

two 5 × 8 inch plates each having a 1 inch centrally located surplus strip to which are hinged two 3½ × 5 inch foldable mask sections for producing standard 3½ × 5 inch prints, and

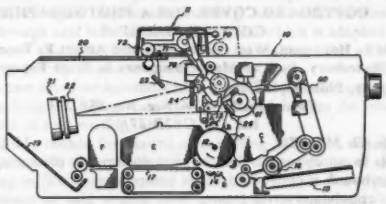
one 8 × 10 inch plate having a 1 inch centrally located surplus strip to which are hinged eight 2½ × 3½ inch foldable mask sections for producing standard 2½ × 3½ inch prints.

3,944,365

DOCUMENT FEEDING APPARATUS AND LATCHING MECHANISM

Warren T. Van Buskirk, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 24, 1974, Ser. No. 482,739
Int. Cl.² G03B 27/62
U.S. Cl. 355—75 **10 Claims**



1. An apparatus for feeding individual sheets over a support surface comprising:

means for feeding sheets over a support surface, said feeding means being movable between an operable position over such surface and an inoperable position off of a support surface;

latching means for locking said feeding means in said operable position over such surface;

actuating means for moving said feeding means between said operable position over such surface and said inoperable position off such surface and for locking and unlocking said latching means; and

means operatively associated with said latching means and said actuating means for unlocking said latching means prior to movement of said feeding means off such surface.

3,944,366

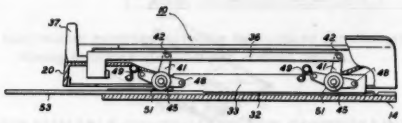
SLIDING PLATEN COVER APPARATUS

Donald A. Robertson, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 26, 1974, Ser. No. 500,803

Int. Cl.² G03B *27/62*

U.S. Cl. 355—76 **3 Claims**



1. Platen cover apparatus comprising:

a frame mounted on a copier machine adjacent to a platen area, said frame being slidable relative to the machine;

cover means mounted on the frame having contiguous walls defining a tray for supporting a stack of documents to be copied and an open bottom therebelow;

a pad member received in the bottom of said cover means;

a parallelogram linkage connecting said pad member to said frame, said linkage being movable from a first position when the cover means is in a non-copying position to a second position in which said linkage is urged against the action of torsion spring means when the cover means is in a copying position,

said linkage including shaft members supporting rollers adapted for sliding along a track on the machine adjacent to the platen area, and

handle means connected to said linkage whereupon after sliding of the cover means over the platen area and actuation of said handle means said linkage is moved from its first position into its second position to position said pad member into frictional contact with a document for copying thereof, and after copying, upon sliding of the cover means in an opposite direction with said handle means engaged the document is transported into a receiving tray on the machine.

3,944,367

COPYBOARD COVER FOR A PHOTOGRAPHIC COPYING MACHINE

Nils L. Hakanson, West Springfield, and Albert F. Touchette, Shutesbury, both of Mass., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Apr. 5, 1974, Ser. No. 458,314

Int. Cl.² G03B *27/62*

U.S. Cl. 355—76 **11 Claims**

1. In an apparatus for copying documents placed upon a copyboard, a copyboard cover comprising:

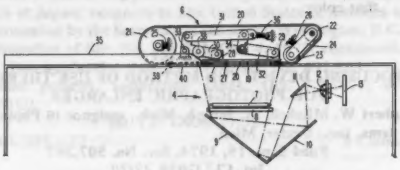
a copyboard cover frame;

means for reciprocating the frame to and from a rearward load position and a forward copy position;

light-blocking cover material associated with the frame for covering the copyboard when the frame is in the copy position;

a pressure plate mounted within the frame for applying pressure against the document on the copyboard to hold the document flat against the copyboard; and

means for reciprocating the pressure plate towards the copyboard in response to the frame moving into the copy



position and from the copyboard in response to the frame beginning movement back to the load position.

3,944,368

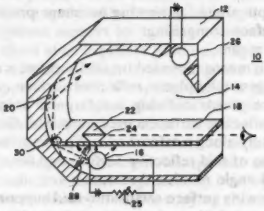
APPARATUS FOR COLOR ANALYSIS OF PRECIOUS STONES

Casper R. Beesley, 210 Commonwealth Ave., Mount Vernon, N.Y. 10552

Filed July 11, 1973, Ser. No. 378,275

Int. Cl.² G01N *21/00*

U.S. Cl. 356—30 **12 Claims**



1. An apparatus for examining a precious stone, comprising:

a. an envelope structure defining an interior space viewable from without said envelope;

b. a light source disposed at said interior space;

c. a white transparent light diffusing means disposed within said interior space;

d. means for locating said precious stone within said interior space adjacent to said light diffusing means such that said stone is in light receiving relationship with said light diffusing means, and said light diffusing means being disposed between said precious stone and said light source, said stone being viewable from a point outside said interior space; and

e. means for reflecting light from said light source, and reflecting means being disposed such that said stone is located between said reflecting means and said viewing point, and being arranged so that at least a portion of the light being reflected by said reflecting means passes from said light source to said viewing point without passing through said light diffusing means.

3,944,369

OPTICAL COMPARATOR SYSTEM TO SEPARATE UNACCEPTABLE DEFECTS FROM ACCEPTABLE EDGE ABERRATIONS

John David Cuthbert, Bethlehem; Delmer Lee Fehrs, Easton, and David Farnham Munro, Alburtis, all of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 24, 1974, Ser. No. 473,233

Int. Cl.² G01B *11/24*

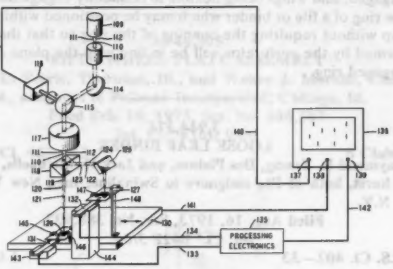
U.S. Cl. 356—167 **22 Claims**

1. Apparatus for comparing a light affecting, patterned workpiece with a similar reference workpiece to detect unac-

ceptable defects in the patterned workpiece to the exclusion of acceptable edge aberrations, the apparatus comprising

means for generating first and second synchronously scanning light signals,

means for maintaining said workpieces in optically equivalent positions, said position maintaining means being movable in a plane orthogonal to said scanning light signals,



means for detecting said light signals affected by said workpieces, said signals being intensity modulated by the patterns on said workpieces, and

means for gating preselected combinations of said first and second modulated signals in accordance with a number of predetermined threshold levels to produce a binary signal indicative of said unacceptable defects in said patterned workpiece with respect to said reference workpiece to the exclusion of said acceptable edge aberrations.

3,944,370

EXPOSURE TIME INDICATION APPARATUS

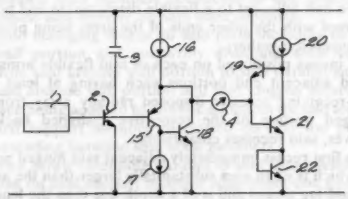
Masahiro Kawasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 6, 1974, Ser. No. 503,925

Claims priority, application Japan, Sept. 21, 1973, 48-110623

Int. Cl.² G01J 1/44

U.S. Cl. 356—226 **3 Claims**



1. Exposure time indication apparatus comprising:

circuit means for producing a reference potential;

a two-terminal meter having one terminal connected to receive the reference potential;

an exposure time measurement section including an output stage transistor having base and emitter electrodes between which there is developed a voltage porportional to the APEX indication quantity for exposure time;

a buffer stage junction transistor having its base-emitter junction connected in series between the base electrode of the output stage transistor and the other terminal of the meter;

biasing means for causing the buffer stage transistor to operate with a substantially constant collector current, the biasing means including a feedback stage junction transistor having its collector and base electrode respectively connected to the emitter and collector electrodes of the buffer stage transistor; and

wherein one of the buffer stage and feedback stage transistors is of the p-n-p type and the other is of the n-p-n type.

3,944,371

RETRACTABLE WRITING IMPLEMENT

Richard Schenk, White Plains, N.Y., assignor to Stacie Pen Corporation, Brooklyn, N.Y.

Filed Apr. 16, 1975, Ser. No. 568,401

Int. Cl.² B43K 24/06

U.S. Cl. 401—110 **1 Claim**

1. A writing implement comprising

a. an elongate barrel having first and second openings at the opposite ends thereof,

b. an elongate cap which includes an opening at one end thereof and which is rotatable with respect to said barrel,

c. a ferrule which is removably received within said second opening of said barrel and which is in non-rotational frictional engagement with the inner sidewall surfaces of said barrel,

d. a guide bushing which is non-rotatably affixed to said ferrule and which is received in said opening in said cap and about which said cap rotates, said guide bushing including an axially extending bore therein which is offset with respect to the longitudinal axis of said bushing,

e. a retaining ring which is mounted for rotation on said guide bushing and which engages the inner surface of said cap so that said ring rotates with said cap,

f. an elongate replaceable writing tube which extends through said bore in said bushing and which is adapted to move axially within said barrel, said writing tube including writing means at one end thereof,

g. a cam member located within and affixed to said cap and including a helical cam surface which engages the other end of said writing tube,

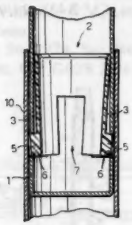
h. spring means for biasing said writing tube into engagement with said cam surface, so that, upon rotation of said cap in first direction, said cam surface causes the writing means of said writing tube to extend through said first opening in said barrel outwardly thereof and, upon rotation said cap in the opposite direction, said cam surface permits said writing means of said writing tube to be retracted within said barrel responsive to the urging of said spring means, said guide bushing being generally cylindrical in construction and extending beyond the end of the barrel to provide a surface about which said cap rotates, said bushing including a peripheral groove in which said retaining ring is received.

3,944,372

DEVICE FOR FASTENING THE CAP OF A FOUNTAIN PEN UPON THE REAR PORTION OF THE BODY OR BARREL OF THE PEN

Franco Verona, Turin, Italy, assignor to Aurora S.p.A., Turin, Italy

Filed July 12, 1974, Ser. No. 488,089
Claims priority, application Italy, July 31, 1973, 69304/73
Int. Cl.[2] B43K 9/00; F16L 39/00
U.S. Cl. 401—244 5 Claims



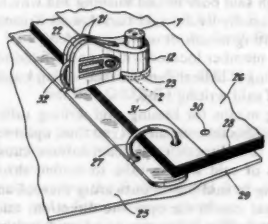
1. In combination with a writing instrument, for example a fountain pen, comprising a body portion with a closed end at the rear thereof and a cap, a device for securing the cap upon the rear of the body portion, said device comprising an open ended annular member disposed coaxially inside said body portion and provided with extensions directed toward said closed end parallel to the axis of the annular member but spaced from the axis, each such extension having a part extending through a corresponding opening in the wall of said body portion and extending beyond the outer surface of said body portion to engage the interior of the cap when the cap is fitted on the rear of said body portion, said extensions being resiliently deformable so that when the protruding parts engage the interior of said cap the extensions are deformed by virtue of the protruding parts' being forced inwardly and the protruding parts exert a reaction force on the interior of the cap.

3,944,373

PERFORATOR

Raymond Farjon; Jacques Farce; Francis Doyelle, all of Boulogne-sur-Mer, and Claude Colin, Saint-Martin-Boulogne, all of France, assignors to Baignol & Farjon S.A., Boulogne-sur-Mer, France

Filed Feb. 8, 1974, Ser. No. 440,868
Claims priority, application France, Jan. 4, 1974, 74.00258
Int. Cl.[2] B42F 3/00
U.S. Cl. 402—1 3 Claims



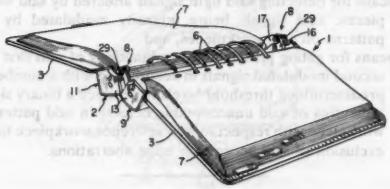
1. A perforator comprising two horizontally spaced and vertically extending symmetrical casings generally vertically joined together at one end thereof and defining therebetween at said one end a body which houses a punch and die for piercing holes in sheets of paper or similar documents, said punch and die having a vertical axis and said punch being disposed in said body for vertical movement along said axis toward and away from said die, said casings each including a wing extending rearwardly from said body opposite said one end, said two casings being joined together adjacent to and rearwardly of said body and adjacent said wings, said wings defining therebetween a vertically disposed narrow gap whose median plane passes through the axis of the punch and die of the perforator and in which a ring of a file or binder may be engaged, said wings being flexible to resiliently engage flatwise the ring of a file or binder which may be positioned within said gap without requiring the opening of the ring so that the hole formed by the perforator will be in line with the plane of the engaged ring.

3,944,374

LOOSE LEAF BINDER

Raymond R. Young, Des Plaines, and Jack H. Michaelis, Elmhurst, both of Ill., assignors to Swingline, Inc., New York, N.Y.

Filed Aug. 16, 1973, Ser. No. 388,937
Int. Cl.[2] B42F 3/04
U.S. Cl. 402—33 1 Claim



1. In a loose leaf binder having a backbone including two hinged together L-Shaped halves having integral end portions, covers hinged to the backbone, a linkage arrangement mounted on the backbone and cooperating therewith to permit the backbone to be placed in and held in a multiplicity of positions the improvement comprising:

a. at least one linkage arrangement having two flexible arms each pivotably mounted at one end to an L-shaped backbone half adjacent to a flexible displaceable end portion thereof with the other ends of the arms being pivotably connected together;

b. lug means positioned on each of said flexible arms;

c. said adjacent end portions each having at least three lug-receiving recesses disposed radially away from the hinged portion of the respective L-shaped backbone halves, said recesses comprising:

1. a first recess immediately adjacent said hinged portion which is of an area substantially larger than the area of said lug means and is of a depth less than the length of said lug means and having the side farthest from said hinge portion sloping to essentially zero depth;

2. a second recess adjacent said first recess which is of an area only slightly larger than the area of said lug means and is of a depth approximately equal to or greater than the length of said lug means; and

3. at least one additional recess similar in area and depth to said second recess;

d. said lug means cooperating with the first recess, the second recess, and the additional recess, whereby the closing of said backbone halves causes said lug means to move from said first recess into said second recess so that the binder is held open in one position and further closing of said backbone halves to cause said lug means to move to said additional recess to that the binder is held in a closed position.

e. said lug means having an angled cam surface to assist in the separation of the lug means from the lug receiving recess during closing of the binder,

f. said linkage arrangement and said end portions being readily displaced toward and away from one another by displacement, deformation and flexing of the binder due to forces applied to the linkage arrangement and backbone halves either intentionally or accidentally, and

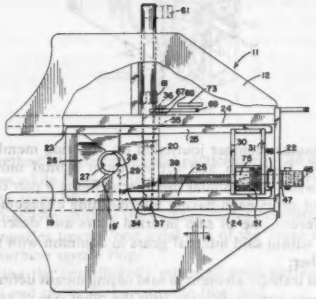
g. said backbone including the L-shaped halves and end portions being formed integrally of plastic material.

3,944,375

FIFTH WHEEL PLATE ASSEMBLY

Ray L. Ferris, Thornton, Ill., and Walter J. Marulic, Gary, Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Feb. 10, 1975, Ser. No. 548,507
Int. Cl.² F16D *9/00*
U.S. Cl. 403—13 **8 Claims**



1. A fifth wheel for connection to the kingpin of a highway trailer including,

a top plate having a substantially rectangular opening including parallel side walls,

slide supports supported below said plate adjacent said side walls of said opening,

a first clamping means having a kingpin receiving surface,

elongated slide members connected to said first clamping means and slidable on said slide supports,

second clamping means on said plate including an arcuate wall portion and outwardly diverging walls extending from said arcuate wall portion to said parallel side walls, said arcuate wall portion and said kingpin receiving surface being adapted to confine a kingpin on said top plate,

a first support member supported on said top plate and extending between said slide members,

a drive screw extending parallel to said slide members,

means on said support member supporting one end of said drive screw,

a second support member on said top plate horizontally spaced from said first support member,

means connecting the other end of said drive screw for rotative movement to and relative to said second support member,

said connecting means including thrust elements on said other end confining said screw against longitudinal movement relative to said second support member, the improvement comprising:

a follower member having a threaded bore rotatably engaged by said drive screw,

said follower member during rotation of said screw including means engageable with said slide members for reciprocating said first clamping means relative to said second clamping means,

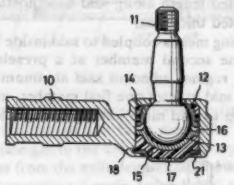
said engageable means including resilient means providing for limited cushioning movement of said slide members and first clamping means relative to said drive screw.

3,944,376

CONSTANT TORQUE BALL JOINT

Toshio Hata, 11-14-403, 1-chome, Denencho, Ohta, Tokyo, Japan

Filed July 1, 1974, Ser. No. 485,039
Claims priority, application Japan, July 2, 1973, 48-73679
Int. Cl.² F16C *11/06*
U.S. Cl. 403—132 **1 Claim**



1. A constant torque ball joint, especially applicable as an automotive steering ball joint, comprising a socket joint rod means having a bearing shell at one end, said shell including a socket cavity and first and second openings;

a ball stud member having a ball head portion positioned in a spaced relation in said socket cavity and having a shank portion connected to said ball head portion and extending through said first opening;

upper and lower segmental semi-spherical bearing cup pieces being made of a self-lubricating material and mounted to provide a spacing between said bearing pieces;

said ball head portion being journalled in said bearing cup pieces; block means each having a segmental spherical surface and being made of an elastic material having a longitudinal elastic modulus Eo of 1.5 to 10 kg/mm² and being tightly interposed between said bearing shell and said bearing cup pieces, said elastic block means consisting of an upper elastic block and a lower elastic block and being mounted, respectively, in a compressed relationship with its segmental spherical surface against the upper and lower bearing cup pieces and with each block space from each other, said elastic blocks being compressed upon assembly at an elastic compression rate of 20 percent or less;

said bearing shell having shoulder means adjacent said second opening; and

a cover disc closing said second opening and being tightly secured against said shoulder means of said bearing shell.

3,944,377

INTERLOCKING JOINT

Jesse G. Defrese, 8500 Red Hill Country Club Drive, Cucamonga, Calif. 91730

Filed Sept. 13, 1974, Ser. No. 505,731
Int. Cl.² B25G *3/00;* **F16D** *1/00;* **F16B** *7/22*
U.S. Cl. 403—189 **16 Claims**

1. An interlocking furniture arrangement for coupling together a plurality of intersecting members in an article of furniture in preselected angular relationships and comprising in combination:

at least one first member having an inside surface and an outside surface;

at least one second member coupled in an intersecting relationship to said at least one first member, and having an inside surface and an outside surface, and said inside surface of said at least one first member abutting said

inside surface of said at least one second member at a first predetermined angular relationship;

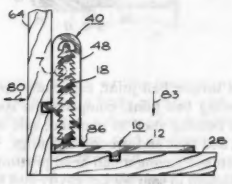
a male joining means coupled to said inside surface of said at least one first member at a preselected location thereon in regions adjacent said abutment to said inside surface of said at least one second member, and comprising:

a base portion having a first surface and a second surface;

first attachment means for attaching said first surface of said base portion to said inside surface of said at least one first member; and

a male portion outwardly upstanding a first preselected height from said second surface of said base portion at said preselected angular relationship, and having a first preselected length along said base portion, and a first preselected thickness;

a female joining means coupled to said inside surface of said at least one second member at a preselected location thereon in regions adjacent said abutment to said inside surface of said at least one first member, and in coupling relationship to said male joining means and comprising:



a base portion having a first surface and a second surface;

second attachment means for attaching said first surface of said base portion of said female joining means to said inside surface of second member;

an outer portion spaced from said base portion and having walls defining an interior surface oppositely disposed to said second surface of said base portion, and said interior surface of said outer portion and said second surface of said base portion defining a male portion receiving cavity having an open end and a closed end and extending substantially parallel to said first surface of said at least one second member, and said male portion of said male joining member inserted in said cavity from said open end thereof, to provide said coupling relationship therebetween, and said cavity having a second preselected length along said base portion, a first preselected depth and a first preselected width; and

retention means cooperatively interacting between said male joining means and said female joining means for retaining said male portion of said male joining means in said cavity of said female joining means in said coupling relationship.

3,944,378

ROTARY FLUID DISPLACEMENT APPARATUS WITH ORBITING TOOTHED RING MEMBER

Hugh L. McDermott, 6101 Ashcroft Ave., Minneapolis, Minn. 55424

Filed Nov. 25, 1974, Ser. No. 526,829

Int. Cl.[2] F01C *1/02*; F03C *3/00*; F04C *1/02*

U.S. Cl. 418—60 **12 Claims**

1. A rotary fluid displacement apparatus comprising:

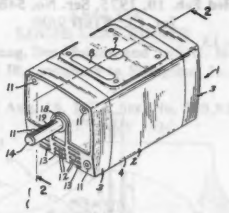
a. casing means defining fluid inlet and outlet openings and a stationary internal gear between said openings;

b. a shaft journaled in said casing means coaxial with said internal gear;

c. a primary rotor fixed on said shaft and including a rotary internal gear and defining fluid passages communicating with one of said openings;

d. a secondary rotor having external tooth elements and fixed on said shaft for rotation therewith in axially spaced relationship to said primary rotor;

e. a cooperating ring member emcompassing said secondary rotor eccentric therewith for rotary and orbital movements relative thereto wherein the axis thereof describes an orbit about the axis of said secondary rotor and said shaft, said ring member having internal tooth elements one more in number than the tooth elements of said secondary rotor, the tooth elements of said ring member and secondary rotor having substantially sealing engagement with each other and cooperating to define inner and outer walls of successively expanding and contracting fluid chambers during said rotary and orbital movement of the ring member;



f. an annular member journaled on said ring member concentric therewith and for common orbital movements therewith, said annular member defining a pair of axially spaced gears each having intermeshing engagement with a different one of said internal gears and describing an orbit within said internal gears in common with said ring member;

g. a fluid transfer element in said casing means defining fluid passages communicating with the other one of said openings in the casing means;

h. and valve means cooperating with said primary rotor and fluid transfer element for delivering fluid from said inlet opening to the expanding ones of said chambers and from the contracting chambers to said outlet openings.

3,944,379

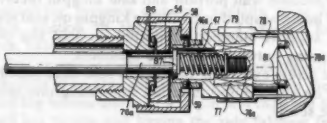
CUTTING APPARATUS

Fred S. Elrod, James Island, S.C.

Filed Nov. 19, 1973, Ser. No. 417,198

Int. Cl. B23b *41/00*

U.S. Cl. 408—79 **8 Claims**



1. Apparatus for cutting work having centering means comprising, in combination, a frame, driving means on said frame, means for supporting said work in a selected position on said frame, a cutting assembly including a housing having an interior, means for mounting said housing on said frame for rotation by said driving means, a cutting head having a central bore, means for supporting said cutting head on said housing for universal radial movement and for rotation with said housing and cutting tool means supported on said cutting head, an elongated rod member extending through said housing and said cutting head central bore in coaxial relationship with said cutting head, said rod member being arranged to rotatably support said cutting head in said coaxial relationship through-

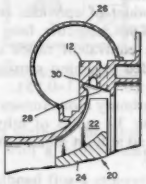
out said universal radial movement, centering means on the end of said rod member adjacent said cutting tool means for centering engagement with said centering means on said work, means on said frame for retaining said rod member against rotation and means on said frame for moving said cutting assembly into operative position with said centering means on said rod member and said work in said centering engagement and with said cutting tool means in cutting engagement with said work.

3,944,380

DIRT EXTRACTING NOZZLE

Johannes F. E. Kampe, Torrance, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 20, 1973, Ser. No. 426,983
Int. Cl.² F04D 29/70
U.S. Cl. 415—1 **9 Claims**



1. A method of extracting solid particles from an expansible gas stream while flowing through a radial inflow turbine comprising the steps of:

centrifugally migrating the solid particles downstream from the nozzles toward one axial end of the inner surface of the turbine nozzle ring;

collecting the centrifugally migrated solid particles at this axial end of the turbine nozzle ring; and

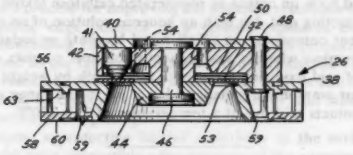
tangentially discharging a portion of the gas with the collected solid particles from this axial end of the turbine nozzle ring to the exterior of the radial inflow turbine nozzle.

3,944,381

COMPRESSOR VALVING

William R. Dirk, Fort Worth, Tex., assignor to Lennox Industries Inc., Marshalltown, Iowa

Filed Dec. 3, 1973, Ser. No. 421,237
Int. Cl.² F04B 21/02
U.S. Cl. 417—564 **5 Claims**



1. In a reciprocating compressor having cylinder means and a piston operable therein and valve means for controlling the passage of suction gas to the cylinder means and the discharge of discharge gas from the cylinder means, characterized by the valve means comprising a main valve body, said main valve body comprising a base having an inner annular wall member and an outer annular wall member extending therefrom, the outer wall member being spaced radially outwardly from the inner wall member and the wall members being in spaced concentric relationship, said wall members having a plurality of spaced recesses therein and a top secured to the ends of the wall members remote from the base so as to define a passageway having a plurality of openings in both the inner wall member and the outer wall member, said top being planar and including a truncated conical portion extending therefrom, the base and the top being bonded to one another to form the main valve body, said passageway having a relatively large volume and the openings in the inner wall member and the outer wall member being relatively large to provide reduced pressure drop of the gas flow through the main valve body, said suction gas entering said passageway through the openings in the outer wall member.

3,944,382

OXIDATION OF VAT AND SULFUR DYES WITH VANADATE ACTIVATED BROMATE OR IODATE

Richard L. Doerr, Orange, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed May 10, 1974, Ser. No. 468,703
Int. Cl.² C09B 9/00; D06P 1/30
U.S. Cl. 8—34 6 Claims

1. In a process for oxidizing vat or sulfur dyes present in reduced form on cotton or regenerated cellulose textile fibers by contacting said dye with an aqueous solution of an oxidizing agent comprising an alkali metal bromate or iodate, the improvement wherein said aqueous solution consists essentially of said oxidizing agent and .005 to 5% by weight alkali metal or ammonium vanadate, has a pH in the range of 3–6 and contacts said dye at a temperature of 75°–200°F.

3,944,383

DYEING PROCESS

Oliver Thurston Davis, Rte. 1, P.O. Box 33, Dunlap, Tenn. 37327

Filed Mar. 13, 1974, Ser. No. 450,907
Int. Cl.² D06P 1/68
U.S. Cl. 8—80 8 Claims

1. In a dyeing process for fibrous materials which comprises contacting in at least one dyeing zone the fibrous material to be dyed with a heated aqueous medium containing a water-soluble or water-dispersible dye for said material, removing said aqueous dye-containing medium from said contacting zone after said dyeing, subjecting said dyed material to at least one water rinse operation, the improvement which comprises passing at least said aqueous dye-containing medium to at least one treating zone, maintaining said aqueous dye-containing medium in said treating zone at a pH of at least 7.0 and thoroughly mixing therewith 1 to 10 parts per million of alkali earth metal hypochlorite, adding to the resulting mixture 1 to 10 parts per million of aluminum sulfate, allowing the resulting mixture to settle and form an upper clear aqueous phase and a bottom phase of colored materials, removing said bottom phase, passing said clear aqueous phase to a heat exchanger means in heat exchange relationship with spent aqueous dye-containing medium from said contacting zone after said dyeing to raise the temperature of the clear aqueous phase, removing said heat exchanged clarified aqueous phase from said heat exchanger means to a residual chlorine removal zone wherein residual chlorine is removed by a method selected from the group consisting of aeration with stirring in the presence of ultra violet light followed by filtration, heating to a temperature of at least 180° F for at least 20 minutes and adding 1 to 10 parts per million of alkali metal thiosulfate, and then reheating and returning the clear, chlorine-free water to said dyeing zone.

3,944,384

FLAME-RETARDANT FILAMENTS

David John Poynton, Coventry, England, assignor to Courtaulds Limited, London, England

Filed Nov. 4, 1974, Ser. No. 520,714
Claims priority, application United Kingdom, Nov. 6, 1973, 51421/73
Int. Cl.² D06M 13/44
U.S. Cl. 8—115.5 11 Claims

1. Acrylic filaments containing a flame retardant which is the reaction product of a dibasic acid amide, an oxyacid of phosphorus and a polyhydroxyl alcohol, the flame retardant being bound to the acrylic filaments by a cross-linking agent selected from the group consisting of tetrakis-hydroxymethyl phosphonium salts, tris-hydroxymethyl phosphine oxide and substituted amines containing two or more amine groups substituted by groups selected from hydroxyalkyl and alkoxyalkyl groups.

3,944,385

PROCESS FOR RENDERING WOOL NON-FELTING

Hans Hostettler, Basel; Heinz Abel, Reinach, and Rosemarie Topfl, Dornach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 6, 1973, Ser. No. 386,139
Claims priority, application Switzerland, Aug. 8, 1972, 11704/72
Int. Cl.² D06M 3/02
U.S. Cl. 8—128 A 26 Claims

1. A process for rendering wool non-felting, wherein the wool is treated at 20° to 100°C with an aqueous preparation which contains

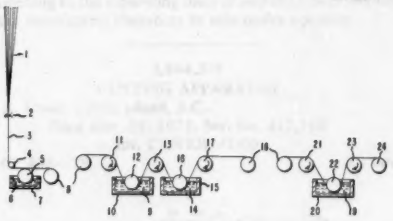
1. an alkali metal, ammonium or amine acid salt of monopersulphuric acid,
2. a reaction product of epoxides containing at least two epoxide groups per molecule, fatty amines and dicarboxylic acids, the equivalent ratios of epoxide groups to hydrogen bonded to amino nitrogen to carboxylic acid groups being 1:(0.1–1):(1–0.55),
3. an adduct of primary monoamines with 12 to 22 carbon atoms and 6 to 30 moles of ethylene oxide, which is esterified with an at least dibasic oxygen containing acid, and, optionally
4. an agent that imparts a soft handle, and is subsequently subjected to a reductive aftertreatment.

3,944,386

PROCESS FOR DYEING FILAMENTS OF ACRYLIC POLYMER

William Kenneth Wilkinson, Waynesboro, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 12, 1973, Ser. No. 415,248
Int. Cl.² D06P 3/70
U.S. Cl. 8—177 R 4 Claims



1. A process for dyeing filaments of dry-spun acrylic polymer which comprises, in sequence, the steps of

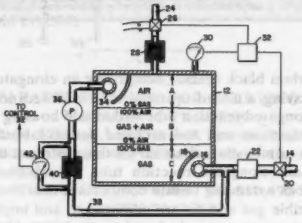
1. dry-spinning a solution of acrylonitrile polymer to form undrawn filaments containing from about 10 to 50 percent by weight of spinning solvent,
2. moistening the spun filaments to have a water content of not over 30 percent by weight,
3. contacting the moist, solvent-containing, undrawn filaments with liquid dye by immersing them in a liquid dye bath,
4. drawing the filaments at least 1.5× while they are still immersed in the dye bath, and
5. immersing the filaments in a hot aqueous bath to rinse the filaments and extract spinning solvent from them.

3,944,387

METHOD AND APPARATUS FOR STERILIZING WITH A HEAVIER-THAN-AIR GAS

Jay G. Schreckendgust, Pittsford, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Continuation of Ser. No. 329,722, Feb. 5, 1973, abandoned. This application Oct. 21, 1974, Ser. No. 516,160
Int. Cl.[2] A61L *1/00, 3/00, 13/04*
U.S. Cl. 21—58 11 Claims



1. In a gas sterilizing method, the steps for replacing air in a sterilizing chamber with a heavier-than-air sterilizing gas comprising:
   a. introducing said gas into said chamber adjacent the bottom thereof at a substantially constant flow rate;
   b. maintaining an open exhaust adjacent the top of said chamber, the air within said chamber being displaced upwardly by said heavier-than-air gas and said air and gas passing through said open exhaust in such a manner that a detectable drag force is created on the air and gas passing through said open exhaust so that pressure in the chamber when just air is passing through said exhaust remains at a first substantially constant level which is lower than a second substantially constant level when just sterilizing gas is passing through said exhaust.
   c. monitoring the pressure in said chamber with a pressure sensor during said gas introduction step and while said exhaust is open, said pressure being correlated to the concentration of gas in said chamber, and
   d. closing said exhaust during said gas introduction step in response to an indication by said pressure sensor that the pressure and therefore the gas concentration in said chamber has reached a predetermined level.

8. In a gas sterilizing apparatus including a sterilizing chamber, gas inlet means adjacent the bottom of said chamber for introducing a heavier-than-air sterilizing gas at a constant flow rate into said chamber and an exhaust means adjacent the top of said chamber for venting said chamber, the improvement comprising:
   a. restrictor means in said exhaust means impeding the passage of air and gas therethrough for imparting a drag to the air and gas displaced and vented from said chamber during the introduction of said gas, the drag imparted to venting gas being greater than the drag imparted to venting air by reason of the density of said gas being greater than that of air;
   b. pressure sensor means operative during the period of gas introduction for monitoring the pressure in said chamber created by the action of said restrictor means impeding the venting of air and gas, the pressure in said chamber under conditions of constant flow of gas into/and displacement from said chamber being correlated to the concentration of gas in said chamber; and
   c. control means maintaining said exhaust means open during introduction of gas into said chamber and closing said exhaust means in response to an indication by said pressure sensor that the pressure and therefore, the concentration of gas in said chamber has reached a predetermined level.

3,944,388

METHOD FOR IMPROVING ABRASION AND WEAR RESISTANCE OF EDGE PORTIONS OF DURABLE PRESS GARMENTS

Nelson F. Getchell, Great Falls, Va., assignor to Cotton Incorporated, New York, N.Y.

Filed Oct. 3, 1973, Ser. No. 403,080
Int. Cl.[2] D06Q *1/02*; D06M *1/00*
U.S. Cl. 8—116.4 9 Claims

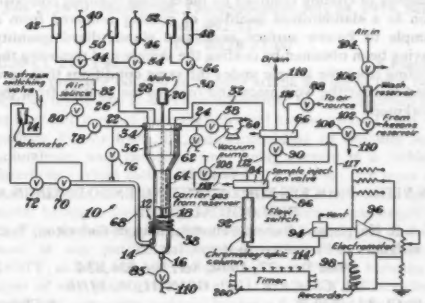
1. In a process for improving the abrasion resistance of wear susceptible edge portions of a garment made of cellulose fiber-containing fabric wherein durable press properties are imparted to the fabric by exposure to formaldehyde vapor in the presence of moisture and a latent acid catalyst and heating the fabric to crosslink the cellulose fibers of said fabric, the improvement comprising:
   applying a protective barrier selectively to the surface of said wear susceptible edge portions of the garment while leaving the main portion of the garment unprotected, said barrier being composed of a material capable of preventing substantial contact of at least one of the catalyst forming components with the said edge portions of the fabric before exposing the garment having the barrier applied thereto to an atmosphere containing formaldehyde and heat curing the fabric to provide a durable press garment having edge portions in which the cellulose fibers are not substantially reacted with formaldehyde while the cellulose fibers are substantially crosslinked with formaldehyde in the main portion of the garment.

3,944,389

DETECTION OF CHLOROMETHYL METHYL ETHER OR BIS-CHLORO-METHYL ETHER

Richard A. Solomon, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 303,123, Nov. 2, 1973, abandoned. This application July 12, 1973, Ser. No. 378,480
Int. Cl.[2] G01N *31/08*
U.S. Cl. 23—230 R 22 Claims

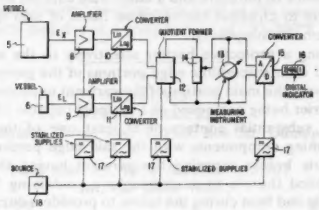


1. A method to determine the presence of chloromethyl methyl ether or bis-chloromethyl ether in a fluid, comprising reacting chloromethyl methyl ether or bis-chloromethyl ether from said fluid with an amount in excess of the stoichiometric amount of an alkali metal salt of an organic hydroxy compound of the formula
   1. R—OH wherein R is lower alkyl, phenyl, chlorophenyl, bromophenyl, alkoxy phenyl, or alkyl phenyl or
   2. thiophenyl or chlorinated thiophenyl or
   3. chlorinated pyridinyl, said compound being dissolved in lower alcohol, running the reaction product through a suitable gas chromatographic column, then passing the eluted components therefrom through a detector and displaying the output of said detector on a suitable readout device.

3,944,390
WORKPIECE SURFACE AREA DETERMINATION

Hans-Wilhelm Lieber, Berlin, Germany, assignor to Fernsteuergerate, Kurt Oelsch KG, Berlin, Germany

Filed Dec. 13, 1973, Ser. No. 424,330
Claims priority, application Germany, Dec. 20, 1972, 2262300; June 14, 1973, 2330213
Int. Cl.² G01N 33/00, 15/08
U.S. Cl. 23—230 R 28 Claims



1. A process for determining the surface area of a workpiece in which the entire surface of the workpiece is smooth which comprises: forming a removable coating of a metal or a metal compound on the entire workpiece surface by immersing the workpiece in a coating composition to obtain a coated workpiece, removing the coating from the workpiece surface by covering the coated workpiece with a coating-removal composition, at least one of the compositions selected from the group consisting of the coating composition and the coating-removal composition being a composition in which mass transfer is practically diffusion controlled, and comparing the quantity of coating removed by the coating removal composition to a standardized quantity of coating removed from a sample of known surface area, said standardized quantity having been obtained by coating the sample and removing the coating from the sample under the same conditions that were used to coat the workpiece and remove the coating from the workpiece.

3,944,391
IN VITRO PROCESS FOR DETECTING ENDOTOXIN IN A BIOLOGICAL FLUID

Nick S. Harris, and Robert Feinstein, both of Galveston, Tex., assignors to Preventive Systems, Inc.

Filed Dec. 27, 1974, Ser. No. 536,834
Int. Cl.² C12K 1/00; G01N 31/06, 33/16
U.S. Cl. 23—230 B 8 Claims

1. An in vitro process for determining the presence or absence of endotoxin in a biological fluid, said process comprising:

a. contacting said biological fluid with a non-ionogenic, hydrophobic, non-polar, aliphatic, synthetic plastic polymer whereby endotoxin present in the fluid is adsorbed by the synthetic plastic polymer;

b. removing said synthetic plastic polymer from contact with the biological fluid;

c. contacting the plastic polymer of (*b*) with amebocyte lysate from the hemolymph of the horseshoe crab, *Limulus polyphemus;*

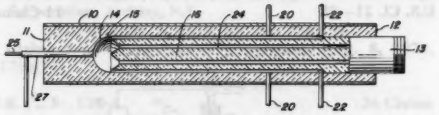
d. incubating the amebocyte lysate in contact with the synthetic plastic polymer of (*c*); and

e. observing the presence or absence of gelation reaction in the amebocyte lysate.

3,944,392
CARBON BLACK REACTOR

Harold R. Hunt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 28, 1974, Ser. No. 436,962
Int. Cl.² C09C 1/50, 1/48
U.S. Cl. 23—259.5 2 Claims

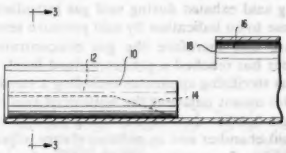


1. A carbon black reactor comprising an elongated tubular housing having a closed upstream and a closed downstream end, an elongated reaction tube within said housing having an open downstream end and a closed concave upstream end defining a combustion chamber in the upstream end of the reactor, said elongated reaction tube having annularly arranged tubes extending to said combustion chamber whereby a combustible gas and air are admitted to and impinge upon the concave upstream end of said combustion chamber, and substantially centrally disposed passageway means extending from said combustion chamber to the closed downstream end of the housing for withdrawing carbon black smoke, a feed inlet extending through the upstream end of the housing and communicating with said combustion zone, and annular air inlet means surrounding said feed inlet extending through the upstream end of the housing and communicating with said combustion zones.

3,944,393
APPARATUS FOR HORIZONTAL PRODUCTION OF SINGLE CRYSTAL STRUCTURE

Royce Gene Schierding, St. Charles; John Russell Young, Jr., Florissant, and David Louis Vadnais, St. Charles, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 21, 1973, Ser. No. 417,857
Int. Cl.² B01D 9/00
U.S. Cl. 23—273 SP 5 Claims



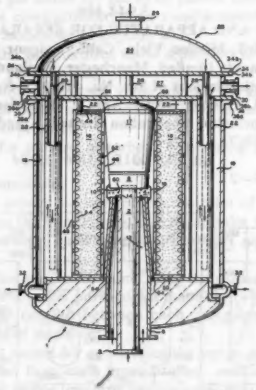
1. A reusable seed crystal holder adapted for use with a horizontally disposed crucible of generally cylindrical configuration formed from quartz tubing having a circular cross-section, said seed holder comprising a solid substantially half cylinder of quartz and adapted to fit snugly and removably within said crucible adjacent one end thereof whereby the entire curved bottom surface of said seed holder is in close-fitted contact with a portion of the interior surface of said crucible, said seed holder having a generally planar top surface, said top surface having a groove of substantially precisely uniform cross-sectional dimensions along its length for holding a seed crystal having the same cross section as said groove, said groove being disposed longitudinally in said seed holder and extending from a first end of said seed holder to the opposite second end of said seed holder, said first end being formed by a planar surface lying in a plane perpendicular to the axis of cylindricity of said seed holder, said second end being formed by a generally planar surface lying in a plane which is angled with respect to said axis of cylindricity such

that said second end surface is sloped to form a ramp intersecting said top surface and said groove and extending downwardly and outwardly from the intersection with said top surface to the intersection with said bottom surface, the depth of said groove being substantially less than the radius of curvature of the bottom surface of said seed holder, said ramp being adapted to form one end wall of said crucible, whereby the surface level of an increasing volume of melt in said crucible is constrained to move up said ramp until it contacts a seed crystal in said groove and whereby said seed holder is adapted to prevent melt in said crucible from escaping from said one end of said crucible.

3,944,394
APPARATUS SUITABLE FOR CARRYING OUT CATALYTIC PROCESS

William A. McClintock, and Oliver P. Proctor, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 31, 1974, Ser. No. 519,692
Int. Cl.² B01J *8/02*
U.S. Cl. 23—288 K **11 Claims**



1. A reactor comprising:
first enclosing wall means forming a mixing chamber;
first conduit means for directly introducing a feedstock into said mixing chamber;
second conduit means for directly introducing a heating fluid into said mixing chamber wherein said heating fluid instantaneously and vigorously mixes with said feedstock to form a mixture of said feedstock and said heating fluid;
second enclosing wall means surrounding said first enclosing wall means, said second enclosing wall means forming a second chamber adapted to contain catalyst, said second chamber positioned adjacent to and circumferentially surrounding said mixing chamber and in open communication therewith for immediately receiving said mixture and having means to discharge an effluent therefrom;
third enclosing wall means surrounding said second enclosing wall means and forming reactor walls; and
cooling means positioned adjacent to said second chamber and positioned inside said third enclosing wall means and in open communication with said second chamber for cooling said effluent.

3,944,395
ELEMENT FOR HEATING SYSTEM

George H. Lutz, 1210 Front St., Binghamton, N.Y. 13905

Division of Ser. No. 358,314, May 8, 1973, Pat. No. 3,813,036. This application Mar. 4, 1974, Ser. No. 447,729
Int. Cl.² B22F *5/00*
U.S. Cl. 29—183.5 **1 Claim**

1. A friction heating element for a closed heating system utilizing a liquid such as oil as the heat transfer medium, said friction heating element comprising:
a compressed block formed of metal wire woven so as to form a tortuous path for the liquid to traverse therethrough said woven metal wire being stainless steel having a diameter of the order of 0.005 inches, and the density of said compressed block being of the order of 0.28 pounds per cubic inch.

3,944,396
PRESSURE BONDED, LOW YIELD STRENGTH COMPOSITE

Joseph A. Chivinsky, Sarver, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 284,854, Aug. 30, 1972, Pat. No. 3,862,484, which is a continuation-in-part of Ser. No. 000,177, Jan. 2, 1970, abandoned. This application July 26, 1974, Ser. No. 492,127
Int. Cl.² B32B *15/00*
U.S. Cl. 29—196.3 **5 Claims**

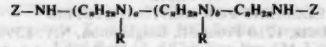
1. A pressure bonded composite article having at least two ferrous layers and at least one nonferrous layer, comprised of: at least one layer of plain carbon steel having up to 0.75 % of carbide former from the group consisting of titanium and columbium, said carbide former being present in a carbide former-to-carbon ratio of from 5 to 15; at least one layer of stainless steel; and at least one layer of a nonferrous third metal having a free energy of oxide formation less negative than the free energy of oxide formation for said plain carbon steel at any particular temperature between 1200° and 2400°F, at least one layer of said third metal being between a layer of said plain carbon steel and a layer of said stainless steel; said composite material having a 0.2% yield strength of less than 50,000 pounds per square inch.

3,944,397
MOTOR FUEL COMPOSITION CONTAINING MANNICH CONDENSATION PRODUCTS

Robert A. Gardiner, St. Paul, Minn., and Bruce H. Garth, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 449,062, March 7, 1974, abandoned. This application Mar. 20, 1975, Ser. No. 560,181
Int. Cl.² C10L *1/22*
U.S. Cl. 44—58 **9 Claims**

1. A motor fuel composition comprising a major amount of hydrocarbons boiling in the gasoline range and a minor amount, sufficient to provide detergency, of a benzyl polyamine of the formula



where Z is an alkyl- and hydroxy-substituted benzyl group wherein the alkyl group has 50 to 1000 carbon atoms and wherein at least 60% of said alkyl group is para to the hydroxyl group, n is 2 to 3, R is hydrogen or Z, *a* and *b* are 0 to 5 and the sum $a + b$ is 0 to 5.

3,944,398

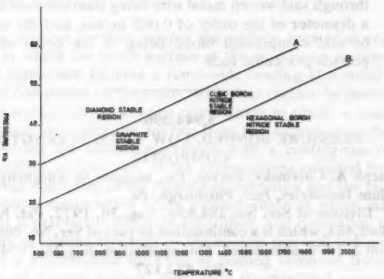
METHOD OF FORMING AN ABRASIVE COMPACT OF CUBIC BORON NITRIDE

Frank Rutherford Bell, Flat 41, Crown Court, 32 Minors St., Yeoville, Transvaal, South Africa

Continuation-in-part of Ser. No. 465,683, April 30, 1974, abandoned. This application Aug. 13, 1974, Ser. No. 496,957

Int. Cl.² B24D *3/04*

U.S. Cl. 51—307 **11 Claims**



1. A method of making an abrasive compact, comprising the steps of forming a mixture of particles of cubic boron nitride, powdered refractory substance selected from the group consisting of silicon nitride, magnesium oxide, spinel and alumina, and a powdered solvent for cubic boron nitride selected from the group consisting of aluminum, lead, tin, magnesium, lithium and an alloy thereof, and subjecting said mixture to elevated temperature and pressure at which cubic boron nitride is crystallographically stable and said solvent partially dissolves said cubic boron nitride to at least a limited extent.

3,944,399

METHOD OF PHYSICAL SEPARATION OF COMPONENTS OF A MOLECULAR BEAM

Jürgen Gspann, Buchig, Germany, assignor to Gesellschaft für Kernforschung mbH, Karlsruhe, Germany

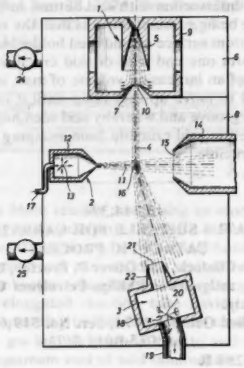
Filed July 9, 1973, Ser. No. 377,253

Claims priority, application Germany, July 8, 1972, 2233741

Int. Cl.² B01D *57/00*

U.S. Cl. 55—17 **22 Claims**

1. A method for physically separating components of a molecular beam with different masses and/or kinetic cross sections, comprising providing a molecular beam in a particular direction; intersecting said molecular beam with at least one auxiliary gas beam for deflecting the components of the



molecular beam by varying degrees to separate them, and catching the separated components.

3,944,400

METHOD AND APPARATUS FOR SEPARATING GASES

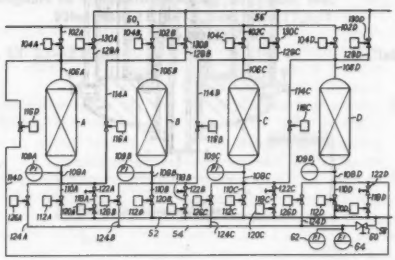
Graham Bird, Mission Viejo, Calif., assignor to Petrocarbon Developments Limited, Manchester, England

Continuation-in-part of Ser. No. 418,027, Nov. 23, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,423

Claims priority, application United Kingdom, Mar. 12, 1974, 11000/74

Int. Cl.² B01D *15/06, 53/04*

U.S. Cl. 55—21 **40 Claims**



1. A method of separating a purified gas from a mixture thereof with at least one gaseous contaminant by pressure swing adsorption, said method comprising the steps of

a. providing an adsorption unit comprising *x* zones of adsorbent material which selectively adsorbs said gaseous contaminant, *x* being a whole number of at least three;

b. passing the gas mixture at a first pressure through *y* of the zones of said adsorption unit arranged in series with respect to the flow of the gas mixture therethrough, *y* being a whole number of from 2 to $x - 1$ and said *y* zones constituting a separation section of said adsorption unit;

c. recovering from the last zone of said separation section a purified gas in which the concentration of the contaminant does not exceed a predetermined value which is below the concentration of contaminant in the gas mixture;

d. before the concentration of the contaminant in said purified gas rises above said predetermined value, but after the concentration of said contaminant in the gas stream leaving the zone forming the penultimate zone of said separation section has exceeded said predetermined

value, adding another zone of said adsorption unit to the end of said separation section, expressed in terms of the direction of flow of said gas mixture through the separation section whereby said added zone now forms the last zone of said separation section;

e. removing from said separation section the zone forming the first zone of the section whereby the zone next to it in the separation section now becomes the first zone;

f. purging the adsorbent in said removed zone of adsorbed material by passing a purge gas through it at a second pressure which is lower than the first pressure whereby to prepare said zone for re-use in the adsorption section commencing as the last zone of said section; and

g. periodically repeating steps (d), (e) and (f) whereby each zone of said unit is in successive periods incorporated into the separation section as the last zone thereof, subsequently periodically progressed along said section until it becomes the first zone thereof, and then purged ready for re-incorporation into the separation section in a subsequent period.

12. Apparatus for separating a purified gas from a mixture thereof with at least one gaseous contaminant, said apparatus comprising a pressure swing adsorption unit comprising a plurality of adsorption zones for adsorbing said contaminant from said mixture and means for purging adsorbent of adsorbed contaminant, said adsorption unit including

at least four compartments for adsorbent, each having a gas inlet and a gas outlet for gas to be passed through adsorbent in the compartment, each compartment forming a separately isolatable adsorption zone,

an inlet for the gas mixtures to be separated in said unit.

an outlet for purified gas,

an inlet manifold connected to the inlet for the gas mixture,

a purified gas outlet manifold connected to the outlet for the purified product,

said means for purging adsorbent comprising a purge gas manifold,

a waste gas manifold,

first conduit means for connecting the inlet of each compartment to the inlet manifold, with an inlet valve in the conduit between each compartment inlet and the inlet manifold,

second conduit means for connecting the outlet from each compartment to the purified gas manifold, with an outlet valve in the conduit between each compartment outlet and the outlet manifold,

third conduit means for connecting the purge gas manifold to the outlet from each compartment, with a purge gas inlet valve in the conduit between each compartment outlet and the purge gas manifold,

fourth conduit means for connecting the inlet to each compartment to the waste gas manifold, there being a waste gas outlet valve between each compartment inlet and the waste gas manifold, and

fifth conduit means adapted to connect the compartments together for flow of gas therethrough with the outlet of each compartment connected to the inlet of the next compartment, there being a valve in the conduit between the outlet of each compartment and the inlet of the next compartment, said valves being arranged such that at least a first and a second of said compartments are connected in series to provide a separation section between the inlet manifold and the outlet manifold for flow of gas therethrough and in that order with respect to the gas flow, at least a third compartment is connected to the outlet manifold for repressurisation and at least a fourth compartment is connected for gas flow therethrough from the purge gas manifold to the waste gas manifold for purging, and automatic valve control means adapted periodically to switch the valves to connect said third compartment in series with said second compartment in said separation section to form the last compartment in said section, expressed in terms of flow of gas therethrough, disconnect said fourth compartment from said purge gas manifold and said waste gas manifold and connect it to said outlet manifold for repressurisation, and disconnect said first compartment from said separation section and connect it between the purge gas manifold and the waste gas manifold for purging.

3,944,401

PROCESS FOR THE REMOVAL OF GASEOUS IMPURITIES FROM THE EXHAUST GASES OF A CONTACT-PROCESS PLANT FOR THE PRODUCTION OF SULFURIC ACID

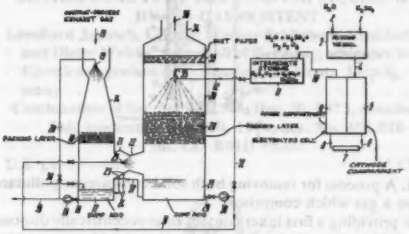
Karl-Heinz Dörr, Mainz; Hugo Grimm, Frankfurt am Main; Ulrich Sander, Friedrichsdorf; Robert Peichl, Kelheim, and Michael Tacke, Offenbach, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main and Sud-Chemie AG, Munich, both of, Germany

Filed May 6, 1974, Ser. No. 467,387

Claims priority, application Germany, May 8, 1973, 2322982

Int. Cl.² B01D 47/14

U.S. Cl. 55—73 **21 Claims**



1. In a method of removing sulfur compounds oxidizable to form sulfuric acid and organic compounds oxidizable to form carbon dioxide and water from an exhaust gas of a contact-process plant for the production of sulfuric acid, wherein:

the exhaust gas is treated in a scrubbing cycle with a recirculated scrubbing acid consisting of a mixture of dilute sulfuric acid and peroxydisulfuric acid,

the peroxydisulfuric acid is produced by electrolyzing continuously dilute sulfuric acid,

the peroxydisulfuric acid is added to the scrubbing-acid cycle and the scrubbing acid takes up sulfuric acid formed as an oxidation product, and

the scrubbing acid is withdrawn from the cycle to remove the oxidation product, the improvement which comprises the steps of:

treating said gas in a vertical venturi tube and in uniflow with circulating scrubbing acid collected in a sump below said venturi tube;

passing the gas into a substantially horizontal venturi tube between said vertical tube and said sump, said horizontal venturi tube opening into an upwardly extending tower;

treating the gas in said horizontal venturi tube in uniflow with circulating scrubbing acid collected at the base of said tower and separating scrubbing acid from the gas in said tower for collection at the base thereof;

passing the gas together with entrained scrubbing acid through a packing layer and treating the gas in said packing layer with a countercurrent flow of circulating scrubbing acid from the base of said tower and introduced above said packing layer;

introducing the peroxydisulfuric acid into the scrubbing acid cycle by injecting it into said tower above said layer;

said peroxy disulfuric acid being produced from fresh dilute sulfuric acid independently of the acid circulated from the base of said tower;

the acid collected at the base of said tower being exclusively fed in a first part to said tower above said packing layer, a second part to said horizontal venturi tube and in a third part to the sump of said vertical venturi tube; and

maintaining the scrubbing acid level in the base of said

tower substantially constant by continuously transferring to said sump as said third part a quantity of scrubbing acid equal to the quantity of added peroxydisulfuric acid and sulfuric acid in said tower and to the sulfuric acid formed as an oxidation product therein.

3,944,402

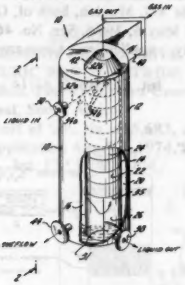
AIR POLLUTION CONTROL APPARATUS AND PROCESS

Paul Cheremisinoff, Closter, N.J., assignor to Engelhard Minerals and Chemicals Corporation, Murray Hill, N.J.

Filed May 6, 1974, Ser. No. 467,098

Int. Cl.² B01D *47/06*

U.S. Cl. 55—92 **9 Claims**



1. A process for removing both solid and gaseous pollutants from a gas which comprises:

a. providing a first inner contact zone eccentrically disposed within a second outer contact zone, said inner contact including packing material therein, said inner contact zone dividing said outer contact zero into an expansion flow passage and a restricted flow passage;

b. flowing a scrubbing liquid into both said inner contact zone and said outer contact zone;

c. flowing a gas sequentially along and through said inner and said outer contact zones, said gas being circulated in said outer contact zone and passing sequentially through said expansion flow passage and said restricted flow passage, and solid pollutants being removed from said gas in said outer contact zone and said gaseous pollutants being removed from said gas in said inner contact zone; and

d. removing said liquid and gas from said zones.

3,944,403

ADSORPTIVE DEVICES

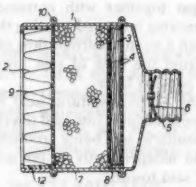
Keith Simpson, Fleet, and Frederick Arthur Pomroy Maggs, Salisbury, both of England, assignors to Siebe Gorman & Company Limited, Chessington, England

Filed Feb. 25, 1974, Ser. No. 445,345

Claims priority, application United Kingdom, Feb. 28, 1973, 9848/73

Int. Cl.² B01D *50/00, 53/02*

U.S. Cl. 55—316 **8 Claims**



1. An adsorptive device comprising:

a. a housing having a gas inlet and a gas outlet; and

b. at least one composite adsorptive element, said element being supported in said housing in the gas path through said housing from said inlet to said outlet, said element comprising a bed of adsorptive carbon in granular form, said granular carbon bed having a depth of at least 4 centimeters, and a bed of adsorptive carbon in fibrous form comprising at least three layers of charcoal cloth, said fibrous carbon bed being situated downstream of said granular carbon bed.

3,944,404

POWDER RECLAMATION DEVICE FOR ELECTROSTATIC POWDER COATING SYSTEMS

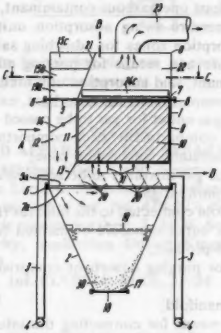
Kalman Andrasfalvy, Hauptstr. 139 - 141, 7553 Muggensturm, Germany

Filed Dec. 19, 1973, Ser. No. 426,404

Claims priority, application Germany, Dec. 19, 1972, 2262084

Int. Cl.² B01D *50/00*

U.S. Cl. 55—294 **5 Claims**



1. A device for reclaiming powders, particularly for electrostatic powder coating systems, comprising, in combination:

a hollow housing having a top and bottom portion;

a filter means mounted in said housing between said top and bottom portion for filtering air passing therethrough and having filter layers defining vertically extending passage openings, said filter layers being wave-like and aligned in a first direction parallel to each other;

partition walls mounted in said housing adjacent to said filter means, for defining suction intake chamber means communicative with an inlet connection on said housing top portion for introducing the powder-laden air to be processed, as well as defining three channels adjacent to said filter compartments, and channel means passing alongside said suction chamber means;

said filter means and said filter layers defining three respective filter sections, each aligned with an adjacent one of said channels;

said suction intake chamber means including three adjacent, downwardly opening compartments, each communicative with a respective one of said three channels, the latter being adjacent, and directed downwardly in said channel means and for dividing the processed air;

said housing bottom portion being funnel-shaped and comunicating with said filter means and said channels, and including an outlet opening for the powder recovered from the processed air; said partition walls including a baffle plate transversely disposed at a bottom portion of said partition walls to constrict the cross-section of said channels, respectively, just above said housing bottom portion;

an exhaust chamber communicating with said housing top portion and communicating downstream with said filter means;

damper means for controlling the flow of air to said suction intake chamber means, including individually adjustable dampers disposed in each of said channels;

compressed-air nozzle means mounted in said housing adjacent to said filter means at the top thereof and including three oblong chambers extending across the tops of the three filter sections, respectively, parallel to said filter layers, and nozzle-type openings linearly aligned in a bottom portion of said oblong chambers, downwardly directed at said filter layers, said oblong chambers being transversely movably mounted across the tops of said filter layers relative to said parallel orientation of said filter layers and further comprising means for selectively applying compressed air to, and connected to, said three oblong chambers, respectively, independently of each other, and wherein said oblong chambers sweep across each of said three filter sections; and means for simultaneously continuously operating said exhaust chamber to reclaim the powder from the processed air passing through at least one of said channels.

3,944,405
DOWN-FLOW CHAMBER

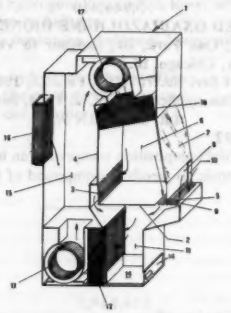
Francois Adriaan van Calsteren, Rijswijk Z.H., and Willem Pieter Hiestand, Delft, both of Netherlands, assignors to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van de Volksgezondheid, The Hague, Netherlands

Filed Nov. 26, 1973, Ser. No. 418,940

Claims priority, application Netherlands, Nov. 24, 1972, 7215945

Int. Cl.² B01D *46/00*

U.S. Cl. 55—338 **5 Claims**



1. A laminar down-flow apparatus comprising in combination:

a. a ceiling, a working floor, side walls, a rear wall and a front wall defining a working room;

b. a grid provided in a front portion of said working floor and extending outwardly of said working room beyond said front wall;

c. means defining an opening in said front wall, said opening being of sufficient magnitude to allow an operator's hands to pass therethrough for performing work in said working room, said opening being bounded by said grid and a lower edge of said front wall spaced vertically from said grid;

d. a movable lid swingably mounted on said lower edge for normally covering said opening, said movable lid normally hanging in substantially vertical orientation and extending substantially down to said grid for dividing said grid into a first grid portion that is disposed in said working room and a second grid portion that is disposed outside said working room;

e. restraining means for preventing said lid from moving from its vertical position in a direction oriented outwardly of said working room;

f. an air inlet filter provided in said ceiling;

g. means defining a suction room beneath said working floor, said suction room being in direct communication with said working room through said first grid portion and with the ambient surroundings externally of said working room through said second grid portion;

h. channel means disposed externally of said working room and maintaining communication between said suction room and said filter; and

i. fan means disposed in said channel means for forcing air from said channel means into said working room through said filter, from said working room into said suction chamber through said first grid portion and from the ambient surroundings into said suction room through said second grid portion.

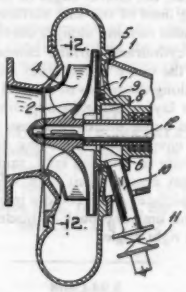
3,944,406
CENTRIFUGAL PUMP FOR PUMPING LIQUIDS WITH HEAVY GAS CONTENT

Leonhard Jagusch, Leipzig; Werner Schönherr, Neukieritzsch, and Dieter Weiske, Borna, all of Germany, assignors to VEB Chemieanlagenbau-und Montagekombinat, Leipzig, Germany

Continuation of Ser. No. 426,746, Dec. 20, 1973, abandoned. This application June 20, 1974, Ser. No. 481,020

Int. Cl.² B01D *47/00*

U.S. Cl. 55—407 **15 Claims**



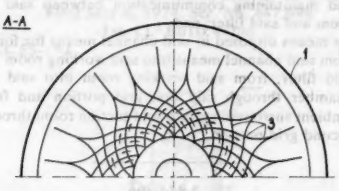
1. A centrifugal pump capable of handling liquids with a heavy gas content comprising a housing, a rotatable impeller disc disposed within the housing, a generally axial inlet opening to one side of the impeller disc and an outlet at the periphery of the impeller disc, said impeller disc comprising a plurality of impeller blades on said one side thereof, said blades extending from a central region to a peripheral region of the disc and defining between adjacent ones thereof ducts leading from a central region of the disc to the periphery thereof, said ducts being of progressively lesser cross section from radially inner portions thereof to radially outer portions thereof, a plurality of impeller blades on the other side of the disc extending from a peripheral region of the disc toward a central region thereof, said blades on said one side of the disc having leading and trailing sides, said disc having a plurality of openings in each duct, said openings being disposed adjacent said trailing sides of said blades on said one side of the disc and communicating with said other side of the disc, each said plurality of openings comprising openings of similar cross sectional area and the spacing between said openings being progressively greater from a central to a peripheral region of said disc, said openings being constituted as means passing a gaseous phase of a pumped medium to said other side of the disc and means communicating with a central region of the housing adjacent said other side of the disc for removal of said gaseous phase.

3,944,407

SEPARATOR FOR GAS DEHUMIDIZATION

Jak Kwasniak, Lodz, Poland, assignor to Politechnika Lodzka, Lodz, Poland

Filed Nov. 29, 1974, Ser. No. 528,563
Claims priority, application Poland, Dec. 11, 1973, 167241
Int. Cl.² B01D 45/12
U.S. Cl. 55—455 4 Claims



1. Apparatus for gas dehumidization comprising a cylindrical housing with a flat bottom having a gas inlet stub pipe, a dehumidifying pack supported by said bottom, said pack having at least two horizontal layers of curved rectangular blades spaced from said housing, a cover having a cone for closing said pack at the top thereof, said blades comprising successive horizontal layers of the pack and being spanned at equal intervals between two concentric vertical imaginary cylindrical surfaces, the lateral edges of the said blades lying on the generating lines of the said surfaces, the longitudinal extent of said blades running along a curve with origin at the inner imaginary cylindrical surface comprising an involute, the other end of the curve at the outer imaginary cylindrical surface running along the radius of the said surface, the curvatures of adjacent layers being in opposite sense, gas outlet means, and liquid outlet means, the base of said cone being mounted to said cover, said cone being directed downwards with vertex opposite to said gas inlet, said cover forming an axially-symmetrical arrangement with said blades and said housing the side surfaces of said blades intersecting said cylindrical surfaces and limit the pack of blades from the outside at substantially a right angle.

3,944,408

METHOD FOR PRODUCING BIOLOGICAL FERTILIZERS FROM SEWAGE

Rudolf Postrihac, Gerichtsgasse 1g, 1210 Vienna, Austria

Filed Mar. 14, 1974, Ser. No. 451,201
Claims priority, application Austria, Mar. 20, 1973, 2464/73
Int. Cl.² C05F 3/00, 7/00, 11/00
U.S. Cl. 71—13 21 Claims

1. A process for preparing a biological fertilizer which comprises treating sewage sedimentation sludge with sulphite waste liquor, at a pH of no more than 6, at a temperature of up to about 25°C, under oxidizing conditions to form a reaction product, and mixing the reaction product with pulverized vegetable matter to form a biological fertilizer.

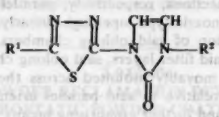
3,944,409

METHOD OF INCREASING THE YIELD OF PLANTS HAVING STORAGE ORGANS BY TREATMENT WITH THIADIAZOLYLIMIDAZOLINES

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Dec. 19, 1974, Ser. No. 531,128
Int. Cl.² A01N 9/22
U.S. Cl. 71—90 7 Claims

1. A method of increasing the yield of plant food contained in plant storage organs which comprises contacting the plants having storage organs with from about 0.05 to about 4.0 pounds per acre of a compound of the formula



wherein R^1 is selected from the group consisting of lower alkyl, lower alkenyl, lower chloroalkyl, trifluoromethyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl, lower alkylsulfinyl and cycloalkyl of from 3 to 7 carbon atoms optionally substituted with from 1 to 2 substituents selected from the group consisting of lower alkyl, lower alkoxy and halogen; and R^2 is lower alkyl.

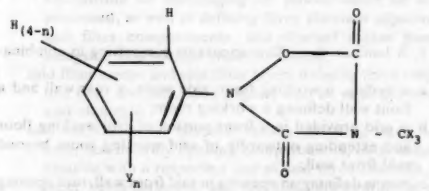
3,944,410

SUBSTITUTED OXADIAZOLIDINE DIONE HERBICIDES

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 707,402, Feb. 23, 1968, Pat. No. 3,872,298. This application Oct. 4, 1974, Ser. No. 511,960
Int. Cl.² A01N 9/22
U.S. Cl. 71—92 7 Claims

1. A herbicidal composition comprising an inert carrier and, in a quantity toxic to weeds, a compound of the formula



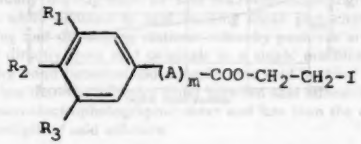
wherein X is selected from the group consisting of fluorine, chlorine and bromine; Y is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl, halogen, lower alkoxy and nitro; and n is an integer from 0 to 4 provided a maximum of two Y's are selected from the group consisting of nitro when n is greater than two.

3,944,411
HALOGENOETHYL ESTERS OF AROMATIC CARBOXYLIC ACIDS AS FRUIT ABSCISSION AGENTS

Otto Rohr, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 239,328, March 29, 1972, Pat. No. 3,821,285. This application Apr. 29, 1974, Ser. No. 462,146
Claims priority, application Switzerland, Apr. 1, 1971, 4775/71
Int. Cl.² A01N 9/24
U.S. Cl. 71—107 6 Claims

1. A process for the promotion of fruit abscission which comprises applying to the fruitbearing plant or to the fruit itself an effective amount of a halogenoethyl ester corresponding to the formula



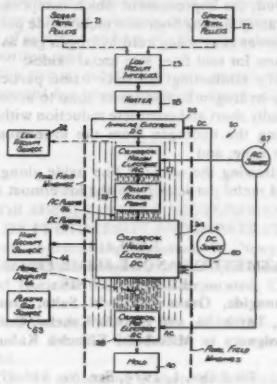
wherein
R_1 represents hydrogen, lower alkyl, lower alkoxy, trifluoromethyl, nitro or halogen,
R_2 represents hydrogen, halogen, lower alkoxy or lower alkyl,
R_3 represents hydrogen or lower alkoxy,
A represents the methylene group and
m represents the number 0 to 1

3,944,412
METHOD FOR RECOVERING METALS

Hsin Liu, 40-25 Hampton St., Elmhurst, N.Y. 11373

Filed Sept. 18, 1974, Ser. No. 507,153
Int. Cl.² C22D 7/00
U.S. Cl. 75—10 R 7 Claims

1. A method for smelting and refining metal material comprising the steps of:
a. establishing a predetermined high level vacuum condition within the interior of an enclosure;
b. establishing a level of background gas within the interior of the enclosure;
c. applying a direct current potential to a pair of electrode spaced apart from one another along the length of the enclosure to form a direct current plasma extending adjacent the electrodes;
d. applying an alternating current potential to a pair of electrodes disposed along the length of the enclosure to form an alternating current plasma extending adjacent the electrodes, the alternating current plasma being formed at a location within the enclosure to superimpose the alternating current plasma upon the direct current plasma to stablize the alternating current plasma;
e. placing the metal material within the alternating current plasma superimposed upon the direct current plasma, the metal material being melted into droplets and having impurities to be refined therefrom removed from the

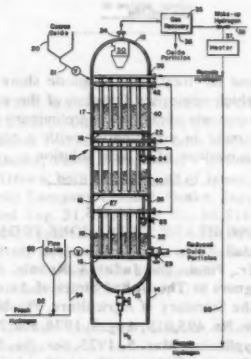


droplets in response to the elevated temperature of the plasma, the bombardment of the plasma and the high level vacuum condition within the enclosure; and
f. collecting the refined molten drops of metal.

3,944,413
DIRECT REDUCTION OF METALLIC OXIDES

William Volk, Princeton, N.J., assignor to Hydrocarbon Research, Inc., Morristown, N.J.

Continuation of Ser. No. 289,298, Sept. 15, 1972, abandoned.
This application Sept. 16, 1974, Ser. No. 506,306
Int. Cl. C21b 13/02
U.S. Cl. 75—35 7 Claims



1. In a method for the direct reduction of metallic oxide particles in a multiple zone reducer using upflowing hydrogen

to maintain the particles of oxides in a fluidized condition at a temperature from about 700°F to about 1000°F and a pressure from about 200 to about 600 psig, and in which a part of the oxides of coarse size range are introduced to the uppermost zone and from which zone the particles pass successively downward to a lower zone after being appropriately contacted with the upflowing hydrogen and the reduced metal particles are removed, the improvement which comprises:

a. separately feeding finer size metal oxide particles directly to a lower zone using cold hydrogen gas as the transport medium for said finer size metal oxides;

b. initially contacting the finer oxide particles with high purity hydrogen in said lower zone to accomplish a substantially short and complete reduction within said zone;

c. passing the hydrogen from the lowermost zone to an upper zone; and

d. withdrawing the reduced fine oxide along with said reduced metal particles from the lowermost zone.

3,944,414
TREATMENT OF ANODE SLIME FROM COPPER ELECTROLYSIS

Tokio Yanagida, Osaka; Ariyoshi Saito, Omiya; Naoyuki Hosoda, Toyonaka, and Fukuzo Kaneko, Omiya, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Japan

Filed Oct. 1, 1974, Ser. No. 511,475
Int. Cl.² C22B 7/00
U.S. Cl. 75—99 **9 Claims**

1. A process for treatment of anode slime from copper electrolysis which comprises flotation of the anode slime by subjecting the anode slime, as a preliminary treatment, to attrition treatment in combination with a copper leaching treatment in a medium of an acid solution.

3,944,415
REMOVING HEAVY METAL IONS FROM WATER

John M. Randall, El Cerrito; Earl Hautala, Martinez; Anthony C. Waiss, Jr., Pinole, and Judith A. Kuhnle, Alameda, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

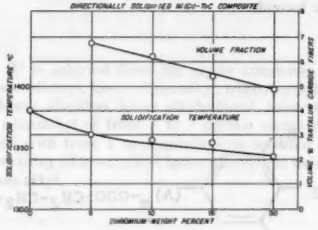
Division of Ser. No. 495,018, Aug. 5, 1974, Pat. No. 3,925,192.
This application Mar. 5, 1975, Ser. No. 555,489
Int. Cl.² C22B 43/00, 15/00, 23/00
U.S. Cl. 75—101 BE **4 Claims**

1. A method for removing dissolved heavy metal ions from water containing the same, which comprises contacting said water with a formaldehyde-modified nut waste, said nut waste being selected from the group consisting of nut hulls, skins, woody shells, expeller meals, and pellicles.

3,944,416
DIRECTIONALLY SOLIDIFIED NICKEL-BASE EUTECTIC ALLOYS

John L. Walter, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed June 24, 1974, Ser. No. 482,589
Int. Cl.² C22C 19/03
U.S. Cl. 75—170 **12 Claims**



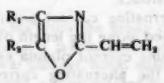
9. An alloy capable of being unidirectionally solidified to provide a composite casting having improved high temperature properties, improved fiber volume fraction, improved fiber density, and capable of forming an aligned eutectic carbide reinforcing fibrous phase embedded in the alloy matrix during unidirectional solidification of the alloy, said alloy comprising a nickel base superalloy consisting essentially of, on a weight basis, 6–15% tungsten, 2–7% rhenium, 0–5% cobalt, 0–5% molybdenum, 2–7% vanadium, 0–4% aluminum, 0–7% chromium, 10–23% tantalum, 0.1–1.5% carbon, and the balance being essentially nickel.

3,944,417
PROCESS FOR THE ELECTROPHOTOGRAPHIC PRODUCTION OF PRINTING PLATES

Erwin Lind, Auringen uber Wiesbaden, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 879,512, Nov. 24, 1969, abandoned.
This application Mar. 25, 1974, Ser. No. 454,274
Claims priority, application Germany, Nov. 27, 1968, 1811209
Int. Cl.² G03G 13/22; G03C 1/70, 5/00
U.S. Cl. 96—1 R **4 Claims**

1. A negative-working reproduction process for the production of a printing form which comprises charging a supported homogeneous layer, exposing the charged layer to light under a master, developing the resulting latent image with an electroscopic material, again exposing the layer to light for not more than about 2 minutes, and removing the developed image areas from the support, said layer consisting essentially of a simultaneously photoconductive and photopolymerizable compound of the formula



in which R_1 is dialkylaminophenyl and R_2 is selected from the group consisting of phenyl or chlorophenyl.

3,944,418

MICROELECTROPHOTOGRAPHIC METHOD

Donald D. Sloan, Weston, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Jan. 11, 1971, Ser. No. 105,372
Int. Cl. G03g *13/22*
U.S. Cl. 96—1 R **11 Claims**

1. A method of microelectrophotographing originals on individual microelectrophotographic sheets to produce a plurality of individual and separate microelectrophotographs, comprising charging each of said sheets, exposing each of said charged sheets to an original through an exposure opening and a reduction lens, and toner developing each of said exposed sheets to produce positive visible, reduced size microimages of said originals on said sheets, each of said microelectrophotographic sheets comprising an electrophotographic layer, containing photoconductive material and an insulator binder, on a conductive base sheet, (according to Claim 1), each of said microelectrophotographic sheets being removably adhered to a backing sheet by a pressure sensitive adhesive and said charging, exposure and developing steps being carried out by individually moving each of said microelectrophotographic sheets while adhered to said backing sheet past charging, exposing and developing stations, whereby positives are obtained directly from said originals in a single machine, the adhesive bond between said adhesive and said backing sheet being less than the adhesive bond between said adhesive and said microelectrophotographic sheet and less than the cohesive strength of said adhesive.

3,944,419

PROXIMITY PRINTING

Alfred I. Bigatel, Allentown; Quentin T. Jarrett, Wescosville; Ronald A. Petskus, Bethlehem; David C. Rowan, Allentown, and Joseph M. Scheetz, Whitehall, all of Pa., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Jan. 30, 1975, Ser. No. 545,682
Int. Cl.² G03C *5/04*
U.S. Cl. 96—27 R **13 Claims**

1. A method of selectively exposing portions of a photosensitive layer comprising:

dispensing a plurality of droplets of a liquid onto a surface of a mask;

solidifying the droplets sufficiently to enable them to hold the mask away from the photosensitive layer;

placing the mask adjacent the photosensitive layer with the droplets therebetween and with the droplets in contact with the mask and the layer; and

projecting electromagnetic radiation of sufficient wavelength and intensity through the mask for a time sufficient to selectively expose the photosensitive layer.

3,944,420

GENERATION OF PERMANENT PHASE HOLOGRAMS AND RELIEF PATTERNS IN DURABLE MEDIA BY CHEMICAL ETCHING

Michael Thomas Gale, Gattikon, and James Kane, Affoltern am Albis, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed May 22, 1974, Ser. No. 472,350
Int. Cl.² G03C *5/00*
U.S. Cl. 96—36 **9 Claims**

1. A method for transferring a spatially-distributed, continuously-variable exposure pattern recorded on the surface of a substantially uniform layer of photoresist on a substrate into a corresponding surface relief pattern on the surface of the substrate itself underlying the photoresist, in which the amplitude on the surface relief pattern at any given point on said surface of said substrate is a function of the amount of exposure of said exposure pattern at the point on said surface of said photoresist which corresponds with that given point, said method comprising the following steps:

a. contacting said exposure pattern with a solution including a photoresist developer which dissolves said photoresist at a rate which is a function of the amount of exposure thereof and with a solution including a substrate etch which etches any revealed portion of said substrate surface at a given rate so that initiation of substrate etching of an earlier-revealed substrate surface portion precedes initiation of substrate etching of a later-revealed substrate surface portion, and

b. terminating step a) substantially at a certain time when said photoresist has been completely dissolved.

3,944,421

PROCESS FOR SIMULTANEOUS DEVELOPMENT AND ETCH OF PHOTORESIST AND SUBSTRATE

James M. Lewis, Aurora, and Raymond W. Newyear, Willoughby, both of Ohio, assignors to Horizons Incorporated, a division of Horizons Research Incorporated, Cleveland, Ohio

Filed Oct. 3, 1973, Ser. No. 403,222
Int. Cl.² G03C *5/00*
U.S. Cl. 96—36 **4 Claims**

1. In a process for processing a photoresist which consists in:

preparing a resist by applying a non-silver photosensitive layer to a suitable substrate, said layer having a composition which consists essentially of (1) an N-vinyl amine, (2) an organic halogen compound in which at least three atoms of a halogen selected from the group consisting of Cl, Br and I are attached to a single carbon atom, and (3) a binder; said photosensitive layer having a thickness between about 0.5 and 5 microns thick;

imagewise exposing said layer to a pattern of actinic radiation in an amount sufficient to produce a change in said layer; and then fixing said layer by heating to between about 80° and 160°C for up to about 1 minute to fix the image formed in said layer by said preceding exposure; the improvement which comprises:

thereafter contacting said layer with a liquid which comprises (1) a developer for the resist layer which includes a solvent selected from the from the group consisting of lower aliphatic alcohols and (2) an etchant for said substrate, selected from the group consisting of alkalies.

3,944,422

PHOTOSENSITIVE MATERIAL IN USE FOR DIAZO-TYPE MULTICOLOR REPRODUCTION

Kouzi Nihyakumen; Toshihiro Kouchi, both of Hirakata; Taizo Yokoyama, Osaka; Yasuo Ueda, Kobe; Yasutoki Kamezawa, and Tatsuo Aizawa, both of Osaka, all of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed Aug. 31, 1970, Ser. No. 68,516
Claims priority, application Japan, Sept. 1, 1969, 44-68937
The portion of the term of this patent subsequent to Feb. 6, 1990, has been disclaimed.
Int. Cl.² G03C *5/18, 1/58*
U.S. Cl. 96—49 **18 Claims**

1. A process for multi-color reproduction, which comprises:

A. exposing image-wise to actinic light a diazotype photosensitive material by exposing through an original sheet of an assembly consisting of (1) an original sheet having opaque image areas and transparent or semi-transparent non-image areas on one surface and a layer containing at least one thermovolatile or sublimable azo coupler (a), coupler (a) being located in only preselected areas which

are contiguous with opaque image areas of said original sheet, said preselected areas being present in only a portion of the areas contiguous with said opaque image areas of said original sheet, and (ii) a diazo-type photosensitive material having a photosensitive layer containing at least one photosensitive diazonium salt (c), a substantially non-thermovolatile acidic stabilizer (d) being present in an amount of at least 5 moles per mole of the diazonium salt (c) and an azo coupler (b) having a substantially lower rate of coupling with the diazonium salt (c) under the developing conditions than that of the azo coupler (a), said original sheet (i) being superposed on said diazo-type photosensitive material (ii) so that the layer of the azo coupler (a) comes into face-to-face contact with the photosensitive layer;

B. heating said assembly to thereby heat-transfer said layer of the coupler (a) to the corresponding position on the surface of said photosensitive layer, said steps (A) and (B) being performed simultaneously or in the time sequence of (A) to (B) or (B) to (A); and

C. contacting the exposed photosensitive material with a mixture of ammonia and steam or an alkali-containing aqueous liquid developer to thereby develop said photosensitive material, whereby in the unexposed latent image area of the portion to which the coupler (a) has been heat-transferred, a dye (c)-(a) having a certain hue or color is formed by the selective reaction of the heat-transferred coupler (a) with the diazonium salt (c) and at the same time, in the unexposed latent image areas to which the coupler (a) has not been heat-transferred a dye (c)-(b) having a different hue or color from said dye (c)-(a) is formed by the reaction of the coupler (b) with the diazonium salt (c), thus producing a multi-colored copied image.

10. A process for multi-color reproduction, which comprises:

A. exposing image-wise to actinic light a diazotype photosensitive material by exposing through an original sheet of an assembly consisting of (i) an original sheet having opaque image areas and transparent non-image areas on one surface and a layer containing at least one thermovolatile or sublimable azo coupler (a), coupler (a) being located in only preselected areas which are contiguous with opaque image areas of said original sheet, said preselected areas being present in only a portion of the areas contiguous with said opaque image areas of said original sheet, and (ii) a diazo-type photosensitive material having a photosensitive layer containing at least one photosensitive diazonium salt (c) and a substantially non-thermovolatile acidic substance (d) being present in an amount of at least 5 moles per mole of the diazonium salt (c), said original sheet (i) being superposed on said diazo-type photosensitive material (ii) so that the layer of the azo coupler (a) comes into face-to-face contact with the photosensitive layer,

B. heating said assembly to thereby heat-transfer said layer of the coupler (a) to the corresponding position on the surface of said photosensitive layer, said steps (A) and (B) being performed simultaneously or in the time sequence of (A) to (B) or (B) to (A); and

C. thereafter developing the exposed photosensitive layer with an alkaline aqueous liquid developer containing a coupler (b), wherein said coupler (a) has a higher coupling rate under developing conditions than said coupler (b), whereby in the unexposed latent image area of the portion to which the coupler (a) has been heat-transferred, a dye (c)-(a) having a certain hue or color is formed by the selective reaction of the heat-transferred coupler (a) with the diazonium salt (c) and at the same time, in the unexposed latent image areas to which the coupler (a) has not been heat-transferred, a dye (c)-(b) having a different hue or color from said dye (c)-(a) is formed by the reaction of the coupler (b) with the diazonium salt (c), thus producing a multicolored copied image.

3,944,423
LIGHT-SENSITIVE DIAZOTYPE MATERIAL COMPRISING A FLUOROALKOXY-SUBSTITUTED DIAZONIUM COMPOUND

Hans-Dieter Frommeld, and Herbert Rauhut, both of Wiesbaden-Biebrich, Germany, assignors to Keuffel & Esser Company, Morristown, N.J.

Filed Sept. 2, 1969, Ser. No. 854,720

Claims priority, application Germany, Sept. 3, 1968, 1793331

Int. Cl.[2] G03C *1/54;* **C07C** *113/00*

U.S. Cl. 96—91 R **5 Claims**

1. Diazotype material comprising a support having coated thereon a light-sensitive composition comprising a diazonium compound wherein said diazonium compound is 4-diethylamino-2-(1′,1′,2′-trifluoro-2′-chloro-ethoxy)-benzene diazonium chloride.

3,944,424
PHOTOGRAPHIC OR IMAGE RECIEVING ELEMENTS CONTAINING POLYMERIC MORDANTS

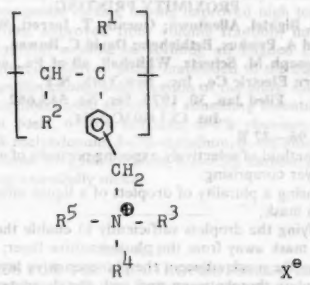
Hyman L. Cohen; Frederick Koeng, and Ignazio Ponticello, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 400,778, Sept. 26, 1973, Pat. No. 3,898,088. This application Feb. 21, 1975, Ser. No. 551,947

Int. Cl.[2] G03C *1/84, 3/00*

U.S. Cl. 96—119 R **10 Claims**

1. A photographic element comprising a support and at least one layer which comprises a water-insoluble polymer comprisng repeating units represented by the following formula:



wherein R^1 and R^2 are hydrogen atoms or alkyl groups and R^3, R^4 and R^5 are alkyl groups wherein the total number of carbon atoms in R^3, R^4 and R^5 is at least 12 and X^- is an anion.

3,944,425
FOAMED LIGHTWEIGHT CERAMIC COMPOSITIONS

Jules Magder, Princeton, N.J., assignor to Princeton Organics, Inc., Princeton, N.J.

Filed Jan. 31, 1974, Ser. No. 438,442

Int. Cl.[2] C04B *21/02, 35/16*

U.S. Cl. 106—40 R **12 Claims**

1. A fired clay product composed of a rigid cellular mass having a bulk density in the range from about 10 to about 105 PCF obtained by mixing, foaming and firing a composition comprising about 20 to about 95 parts of clay, about 4 to about 35 parts of hydraulic cement, about 0.2 to about 30 parts of inert particulate lamellar foam stabilizer, from 0 up to about 76 parts of inert solid material, about 21 to about 70 parts of water, and a gas generating agent, said parts being by weight of the dry ingredients, all of the foaming action having occurred between cessation of said mixing and about 10 minutes thereafter.

3,944,426

METHOD OF SINTERING CALCIUM ALUMINATE RAW MIXES

Hubert O. Nickelsen, Saratoga, Calif.; Joseph E. Kopanda, Crown Point, and Felix J. Piasecki, Whiting, both of Ind., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 249,011, May 1, 1972, abandoned, which is a division of Ser. No. 58,188, July 24, 1970, Pat. No. 3,677,781, which is a continuation-in-part of Ser. No. 677,991, Oct. 25, 1967, abandoned. This application Mar. 18, 1974, Ser. No. 452,030

The portion of the term of this patent subsequent to July 18, 1989, has been disclaimed.

Int. Cl.[2] C04B 7/42

U.S. Cl. 106—100 4 Claims

1. In the method of sintering a calcium aluminate raw mix including by weight at least 28% by weight of Al_2O_3, in which a raw mix is converted into a clinker by heating it to a temperature sufficient to remove surface water and water of crystallization, and then rapidly heated to a sintering temperature of at least 50° – 250°F below the melting point of the raw mix, wherein the improvement comprising adding from 0.5 to 4.0% SO_3 by weight to the mix in the form of $CaSO_4$ to broaden its sintering range.

3,944,427

GELABLE AND GELLED COMPOSITIONS

John P. Sullivan, Jr., Malden, Mass., assignor to Itek Corporation, Lexington, Mass.

Division of Ser. No. 26,098, April 6, 1970, Pat. No. 3,700,451. This application Aug. 11, 1972, Ser. No. 279,915

Int. Cl.[2] C08L 5/00

U.S. Cl. 106—208 4 Claims

1. A composition comprising a liquid medium and a combination gelling agent which consists essentially of (a) from about 0.5% to about 5% agar and (b) from about 0.1% to about 0.5% of a mixture of xanthan gum and locust bean gum in a weight ratio of about 10% to about 99% xanthan gum and from about 1% to about 90% locust bean gum.

3,944,428

ALKALINE CURING CORRUGATING ADHESIVE

Jules E. Schoenberg, Scotch Plains, and Dilip K. Ray-Chaudhuri, Somerville, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Mar. 6, 1975, Ser. No. 555,934

Int. Cl.[2] C08B 25/02, 27/22

U.S. Cl. 106—213 16 Claims

1. A corrugating adhesive comprising (a) starch in a concentration of from about 10 to 40%, based on the total weight of the adhesive, wherein a minor portion of the starch is gelatinized and the remainder is ungelatinized; (b) an alkali in a concentration of from about 0.3 to 4%, based on the total weight of starch; (c) a crosslinking member in a concentration of from 0.3 to 10%, based on the total weight of the starch, comprising at least 15%, based on the weight of the crosslinking member, of an acetoacetamide-formaldehyde condensate wherein the acetoacetamide contains from four to 12 carbon atoms and has the following structure:

where R_1 and R_2 are selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl hydroxyalkyl, alkoxyalkyl groups; or R_1 and R_2 may be jointed to form a heterocyclic ring; wherein the acetoacetamide-formaldehyde condensate contains from about 2 to about 6 moles formaldehyde per mple acetoacetamide and the pH during the formation of the condensate is 9.5 to 11.5 and (d) from about 54 to 89% water, based on the total weight of the adhesive.

3,944,429

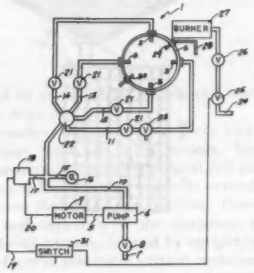
CLEANING DEVICE

Erwin R. Trudell, 4237 W. Sacramento, Saint Louis, Mo. 63106

Filed Sept. 17, 1971, Ser. No. 181,308

Int. Cl. B08b 3/02

U.S. Cl. 134—99 1 Claim



1. A parts washer/dryer for cleaning and drying machine parts comprising,

housing means,

tank means operably mounted in said housing means, said tank means provided with drain means,

a plurality of nozzles mounted on the interior surface of the top, bottom and sides of said tank means and directed towards the center of said tank means,

pump means operably mounted in said housing means, said pump means operably coupled to said nozzles to provide liquids to said tank means,

heating means operably mounted in said housing means and conductively coupled to said tank means,

air inlet and outlet means operably mounted on said tank means, said air inlet and outlet means disposed apart from said nozzles and inoperative during use of said nozzles,

liquid control means operably coupled between said nozzles and said pump means,

hose means, said hose means connected at one end to the input of said pump means and connected at the other end to liquid supply means, said liquid supply means being either fresh liquid or the drain means of said tank means,

pressure sensing means operably disposed between said pump means and said nozzles, said pressure sensing means operably coupled to said pump means and adopted to turnoff said pump if the pressure at the output of the pump exceeds a predetermined amount.

3,944,430

RECHARGEABLE GALVANIC CELL AND ELECTROLYTE THEREFOR-II

Tien Shuey Lee, Rocky River, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 18, 1970, Ser. No. 73,582
Int. Cl.² H01M 6/04
U.S. Cl. 136—30 13 Claims

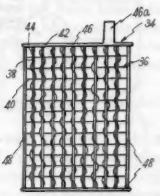
1. A rechargeable galvanic cell including a zinc anode, a cathode, and an electrolyte, wherein the electrolyte comprises an aqueous solution containing soluble zinc and a quaternary ammonium compound in an amount sufficient to suppress formation of dendrites on said zinc anode during charging of the cell, said amount being a concentration of said quaternary ammonium compound in said electrolyte within the range of from about 5×10^{-4} molar to about 5×10^{-1} molar.

3,944,431

PLATE GRID IN USE FOR A PLATE FOR A LEAD STORAGE BATTERY

Shinichi Ikari, Kumagaya; Takumi Hayakawa, Honjoh; Yozo Kamikawa, Saitama, and Fumito Imai, Suita, all of Japan, assignors to Keishin Matsumoto, Tokyo, Japan

Filed May 3, 1974, Ser. No. 466,729
Int. Cl.² H01M 35/04
U.S. Cl. 136—36 7 Claims



1. A plate grid for use in a plate for a lead storage battery comprising a woven member having a plurality of spaced latitudinal wire members of acid resisting material and a plurality of spaced longitudinal wire members which are woven together, said longitudinal wire members each including a wire element of acid resisting material and a wire element of electrically conductive material selected from a group consisting of lead and lead alloy, said electrically conductive wire element wound around said acid resisting wire element of said longitudinal wire member; and a collector of electrically conductive material selected from a group consisting of lead and lead alloy, said collector attached to one of the ends of said longitudinal wire members whereby said collector is electrically connected to said electrically conductive wire elements of said longitudinal wire members.

3,944,432

STORAGE BATTERY PLATE AND MANUFACTURING PROCESS THEREFOR

Jurgen Brinkmann; Manfred Rasche, both of Hagen, and Willi Heissmann, Nachrodt, all of Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

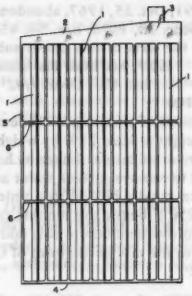
Filed Jan. 29, 1974, Ser. No. 437,703
Claims priority, application Germany, Feb. 3, 1973, 2305309
Int. Cl.² H01M 35/04
U.S. Cl. 136—63 12 Claims

1. A storage battery plate comprising:

a grid formed of plastic strips and plastic cross-connections between said strips, said strips defining channels for containing the active mass;

a grid of lead bars recessed within said channels;

active mass substantially filling said channels and surrounding said recessed lead bars, said active mass being positioned to leave edges of said plastic strips and cross-connections exposed; and



electrolyte permeable fibrous mats covering said grid on both sides

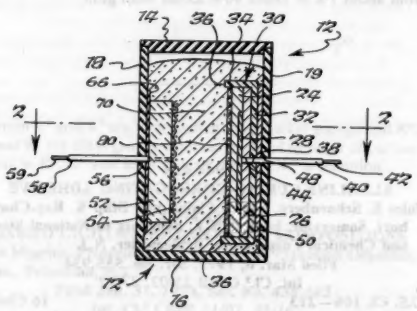
said mats being firmly attached to said exposed edges of plastic strips and plastic cross-connections.

3,944,433

LITHIUM IODINE BATTERY HAVING IMPROVED ENERGY DENSITY

Ralph T. Mead, Kenmore; Wilson Greatbatch, Clarence, and Frank W. Rudolph, Depew, all of N.Y., assignors to Wilson Greatbatch, Clarence, N.Y.

Filed Jan. 9, 1975, Ser. No. 539,730
Int. Cl.² H01M 4/36
U.S. Cl. 136—83 R 17 Claims



1. A lithium-iodine cell comprising:

a. lithium anode means including a lithium element and an anode current collector operatively associated with said lithium element; and

b. cathode means comprising an iodine element, a charge transfer complex of an organic donor component and iodine and a cathode current collector operatively positioned between said iodine element and said charge transfer complex and operative to diffuse iodine from said iodine element to said charge transfer complex.

3,944,434

HYBRID ELECTRODE FOR METAL/AIR CELLS

Dieter Gröppel, and Gisela Siemsen, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 30, 1975, Ser. No. 545,403
Claims priority, application Germany, Jan. 30, 1974, 2404444; Nov. 22, 1974, 2455431
Int. Cl.² H01M 4/00
U.S. Cl. 136—86 A 18 Claims

1. A hybrid electrode for use in metal/air cells of the type having a hydrophilic layer of nickel on the electrolyte side for use in oxygen precipitation, a hydrophobic layer of plastic on the gas side and a hydrophobic layer of carbon between said two layers, the carbon layer containing an embedded metallic structure and being used for the dissolution of oxygen, wherein the improvement comprises:

a. a metallic structure embedded in the carbon layer which is firmly connected on the electrolyte side to the nickel layer, with the metallic structure protruding at least partially on the gas side beyond the carbon layer and into the plastic layer; and

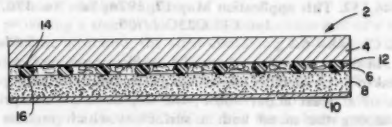
b. a metallic structure embedded in the plastic layer, said metallic structure being firmly connected to the portion of the metallic structure embedded in the carbon layer which protrudes into the plastic layer.

3,944,435

BONDED COMPONENT ASSEMBLY FOR FLAT CELLS AND METHOD THEREFOR

Karl V. Kordesch, Lakewood, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 24, 1974, Ser. No. 536,184
Int. Cl.² H01M 6/06
U.S. Cl. 136—111 18 Claims



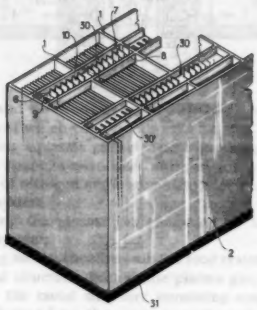
1. A component assembly for use in electrochemical cells comprising a first component, a second component and at least one plastic non-conductive network having openings disposed substantially coextensively between and adhesively secured to said first component at one of its faces and to said second component at its opposite face thereby maintaining said first component and said second component in a secured, spaced-apart relationship said openings having active or inactive material in contact with the faces of the two components.

3,944,436

ELECTRICAL CONNECTION BETWEEN GROUPS OF LEAD PLATES FOR ELECTRIC ACCUMULATOR ELEMENTS AND METHOD FOR FORMING THE SAME

René Gaide, Andilly, France, assignor to Societe Fulmen, Clichy and Manufacture D'Accumulateurs et D'Objets Moules, Paris, both of, France

Continuation of Ser. No. 213,944, Dec. 30, 1971, abandoned. This application Oct. 9, 1973, Ser. No. 404,574
Claims priority, application France, Dec. 30, 1970, 70.47313
Int. Cl.² H01M 10/12
U.S. Cl. 136—176 4 Claims



1. A method of constructing a multi-cell storage battery comprising the steps of:

molding a container of plastic in one piece with outer vertical container walls, an open bottom, longitudinally-spaced transversely extending vertical cell partitions and transversely-spaced parallel channels extending longitudinally across the top of the container from and facing upwardly and outwardly of the container, said parallel channels being partially formed by upright spaced walls, the upper faces of said outer vertical container walls, said spaced upright walls defining said channels and said transversely extending partitions being coplanar, said channels having sections spanning adjacent cells and extending through the cell partition separating said adjacent cells, forming longitudinally-spaced openings within the base of the channels for receiving plate lugs of the same polarity, inserting a plurality of battery plates through the open bottom of said container when said container is in an inverted position with the edges of the plates contacting the undersides of the channel base and with the lugs inserted within respective openings within the base of said channels, sealably coupling an imperforate bottom member to the open bottom of the container to fixedly locate said plates therein, electrically and mechanically coupling the lugs within channel sections together by at least melting said lugs within said channel sections to form strap connectors therein, and thermal welding a lid onto the container top at the coplanar upper faces of the upright walls defining said channels, the container walls, and the longitudinally-spaced paritions to seal the strap connectors within said channel sections.

3,944,437

EXPLOSION PROOF VENTING DEVICE FOR ELECTRICAL STORAGE BATTERIES

Joab Auerbach, 18a MacDonald St., Ramat Gan, Israel

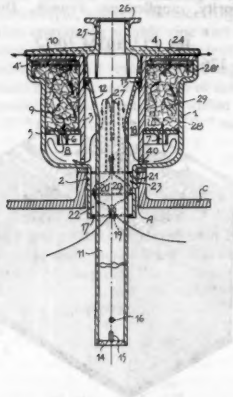
Filed Sept. 16, 1974, Ser. No. 506,745
Int. Cl.² H01M 2/12
U.S. Cl. 136—179 14 Claims

1. An explosion proof venting device for storage batteries, comprising:

a cup shaped body having a substantially tubular lower end for connection with a cell aperture of the storage battery;

a centrally pierced horizontal plate connected to said cup shaped body near the top thereof;

a ring shaped disc of acid resistant porous material, serving as a flame barrier, attached to the underside of said horizontal plate;



a lid carried on the top end of said cup shaped body and spaced from said horizontal plate, the space between said lid and said plate having access to the atmosphere; and

directing means for forcing gas entering the tubular lower end of said cup shaped body to pass through said disc and said plate before passing to the atmosphere.

3,944,438

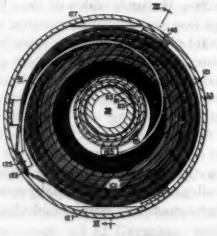
GENERATION OF ELECTRICAL POWER

Thomas F. Hursen, Monroeville; Steven A. Kolenik, Leechburg, and David L. Purdy, Indiana, all of Pa., assignors to Arco Medical Products Company, Leechburg, Pa.

Division of Ser. No. 171,383, Aug. 12, 1971, Pat. No. 3,818,304, which is a continuation-in-part of Ser. No. 827,187, May 23, 1969, abandoned. This application Mar. 11, 1974, Ser. No. 450,130

Int. Cl.[2] G21H *1/10*

U.S. Cl. 136—202 **5 Claims**



2. A heat-to-electricity converter including a container bounded by a thermally conducting wall and having disposed therein a heat source, a heat shield within said container enclosing said source, and a thermoelectric strip extending through said shield having a hot junction in heat-interchange relationship with said source and a cold junction in heat-interchange relationship with said wall, the only heat-conduction path through said strip from said hot junction to said cold junction being longitudinal of said strip, said source being generally cylindrical having a base and the thermoelectric strip having a generally helical form with the hot junction at inner end of the spiral and the cold junction at the outer end of the spiral, said hot junction end being in heat-exchange relationship with said source, the positioning of the strip in the container being such that any hypothetical radial line from the source to the wall intersects the strip only once, said source being radioactive, emitting gamma rays and the heat-shield is composed substantially of tantalum.

3,944,439

METHOD OF PREPARING HIGH FATIGUE STRENGTH ALUMINUM ALLOY

Michael J. Pryor, Woodbridge; James A. Ford, North Haven, and Sheldon W. Dean, Hamden, all of Conn., assignors to Swiss Aluminium Limited, Chippis, Switzerland

Division of Ser. No. 451,795, March 18, 1974. This application Jan. 29, 1975, Ser. No. 545,070

Int. Cl.[2] C22F *1/04*

U.S. Cl. 148—2 **6 Claims**

1. A method of preparing a high fatigue strength aluminum alloy comprising:

A. casting an aluminum alloy consisting essentially of from 0.2 to 0.75% magnesium, from 0.45 to 0.7% copper, from 0.1 to 0.7% iron, from 0.001 to 0.3% silicon, balance aluminum;

B. homogenizing at a temperature of between 900° and 1150°F, but below the solidus temperature of the alloy, for a period of time of between 2 and 24 hours;

C. hot rolling at a temperature of between 750° and 900°F;

D. cold rolling and annealing to penultimate gage;

E. applying a final cold reduction of at least 20%; and

F. partially annealing to produce a high fatigue strength aluminum alloy.

3,944,440

SELECTIVE REFLECTING METAL/METAL OXIDE COATINGS USING SURFACTANT TO PROMOTE UNIFORM OXIDATION

Helmut Franz, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 252,803, May 12, 1972, Pat. No. 3,846,152. This application May 17, 1974, Ser. No. 470,768

Int. Cl.[2] C23C *11/00*

U.S. Cl. 148—6.3 **7 Claims**

1. In the preparation of a metal oxide comprising heating a metal to be oxidized in an oxidizing atmosphere to a temperature of at least about 300°F, the improvement comprising contacting the metal with a surfactant which renders the surface of the metal hydrophobic when dried in air and then drying the contacted metal prior to heating the metal to a temperature of at least about 300°F.

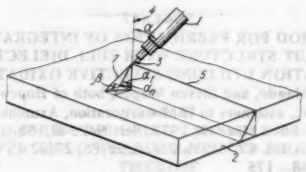
7. The method according to claim 1 wherein, the step of contacting the metal with a surfactant which renders the surface of the metal hydrophobic when dried in air, the surfactant is selected from the group consisting of sorbitan monolaurate, acetylene glycol 2,4,7,9-tetramethyl-5 decyne-4,7 diol and mixtures of sodium carbonate, ethylene diamine tetraacetic acid, fatty acid-ethoxylated adducts, ethylene glycol and sulfated quaternary ammonium compounds.

3,944,441

METHOD OF MAKING PARTS FROM SHEET METAL BY MEANS OF OXYGEN CUTTING AND AN ARRANGEMENT FOR ORIENTATING THE GAS CUTTING MACHINE TORCH IN WORKING BY SAID METHOD

Shimon Abramovich Vainer, ulitsa Logovskaya, 43, kv. 21; Anatoly Fedorovich Temerev, ulitsa Tsimlyanskaya, 34, kv. 46; Savely Abramovich Vainer, ulitsa Krasnopiterskaya, 23, kv. 46; Sergei Sergeevich Nikulin, ulitsa Bakhturova, 1, kv. 26; Matvei Evseevich Kheifets, ulitsa Dotsenko, 37, kv. 11; Vadim Anatolievich Usoltsev, ulitsa Panfilovskaya, 3, kv. 3; Evgeny Fedorovich Matveev, ulitsa Astrovskaya, 13; Georgy Petrovich Kazakov, ulitsa Petrogradskaya, 16, kv. 2; Vladimir Alexandrovich Salkov, ulitsa Krasnopresnenskaya, 31, kv. 33, and Anatoly Isidorovich Malinin, ulitsa Dotsenko, 74, kv. 21, all of Volgograd, U.S.S.R.

Filed Apr. 22, 1974, Ser. No. 463,063
Int. Cl.² B23K 7/02
U.S. Cl. 148—9 R **1 Claim**



1. A method of making parts from sheet metal by means of oxygen cutting by positioning the cutting torch so as to direct the oxygen jet at an angle of 4°–5° from the vertical in the direction of the cut and at an equal angle toward the part being cut out and, during its cutting movement, keeping the torch orientated so that the angle of the oxygen jet to the cutting path remains constant irrespective of changes in the direction of the cut.

3,944,442

AIR HARDENABLE, FORMABLE STEEL

Stephen James Donachie, New Windsor, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 379,118, July 13, 1973, abandoned, and a continuation-in-part of Ser. No. 379,119, July 13, 1973, abandoned. This application July 29, 1974, Ser. No. 492,739
Int. Cl.² C21D 7/00, 9/00
U.S. Cl. 148—12 F **9 Claims**

1. A process for producing a steel adapted for structural applications which comprises:

i. providing a steel of correlated composition and of a martensitic structure, the steel containing up to about 0.2% carbon, up to about 4% manganese, up to about 3% nickel, up to about 6% chromium, up to about 4% molybdenum, up to about 1.25% copper, up to about 1% aluminum, up to about 1% silicon, and the balance essentially iron, the constituents being interrelated to satisfy the following Base Factor (BF) relationship:

$$5 \times \%C, + \%Mn, + \%Cr, + \tfrac{1}{3} \times \%Ni, + \%Mo; + \tfrac{1}{3}\ \%Cu, + \tfrac{1}{2}\ \%Al, + \tfrac{1}{4}\ \%Si \geq 5;$$

ii. heating the steel above its recrystallization temperature but below its A_1 temperature;

iii. cooling the steel to a temperature desired for forming;

iv. subjecting the steel to a forming operation to attain the configuration desired;

v. heating the formed structure at a temperature above the A_3 temperature of the steel; and

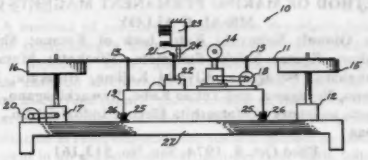
vi. thereafter cooling the structure formed.

3,944,443

ULTRA HIGH TEMPERATURE CHEMICAL REACTIONS WITH METALS

Francis Lee Jones, 1510 N. Barcelona, Pensacola, Fla. 32501

Filed May 1, 1974, Ser. No. 465,815
Int. Cl.² C21D 1/74; C22F 1/02
U.S. Cl. 148—16.5 **9 Claims**



1. A method for treating metal structures to harden the surface thereof which comprises:

a. generating a plasma gas selected from the group consisting of propane, a mixture of nitrogen and propane and a mixture of nitrogen and boron trifluoride by an induction plasma system;

b. stabilizing the plasma gas generated by the induction plasma system;

c. providing an electrically insulated feed system for passing the metal structure through the plasma gas;

d. passing the metal structure consisting essentially of a metal selected from the group consisting of steel compositions, cast iron, aluminum, titanium and alloys of said metals through the plasma gas at a speed of from 60 to 150 feet per minute; and

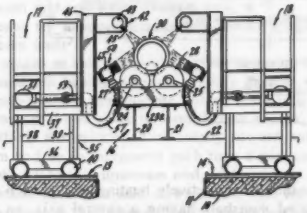
e. quenching the surface of the metal structure with a fluid immediately after the metal structure has passed through the plasma gas to harden the surface thereof.

3,944,444

METHOD FOR HEAT TREATING CYLINDRICAL PRODUCTS

Harold C. Thiess, Salem, Wis., and Harold N. Jahnke, Mount Prospect, Ill., assignors to A. Finkl & Sons Company, Chicago, Ill.

Continuation-in-part of Ser. No. 145,203, May 20, 1971, abandoned. This application Nov. 19, 1971, Ser. No. 200,393
Int. Cl. C21d 1/62, 9/38
U.S. Cl. 148—12.4 **19 Claims**



1. In a method of producing a cylindrical product having a differential radial hardness, such as a mill roll, the steps of

subjecting a cylindrical product to conventional conditioning steps prior to the final hardening operation, and thereafter, in the final hardening operation,

simultaneously rapidly heating the entire working surface area of said cylindrical product by subjecting the entire working surface area to flame heat for a period of time sufficient to austenitize the cylindrical product to a desired depth,

subjecting said entire working surface area of the cylindrical product to a drastic quench which is substantially uniform throughout said area, and

thereafter subjecting said cylindrical product to final conditioning.

3,944,445

METHOD OF MAKING PERMANENT MAGNETS OF MN-AL-C ALLOY

Tadoa Ohtani; Nobuyuki Kato, both of Katano; Shigeru Kojima, Kyoto; Yoichi Sakamoto, Hirakata; Masaharu Tsukahara, Neyagawa; Kiyoshi Kojima, Hirakata; Isago Konno, Neyagawa, and Takao Kubo, Kawachinagano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Oct. 8, 1974, Ser. No. 513,161

Claims priority, application Japan, Oct. 19, 1973, 48-118278

Int. Cl.² H01F 1/00

U.S. Cl. 148—121 **4 Claims**

1. A method of making an isotropic permanent magnet, which comprises the steps of:

1. preparing an alloy comprising the composition of 71.0% to 73.0% by weight of manganese, (1/10 Mn—6.6)% to (⅛ Mn—22.2)% by weight of carbon and remainder aluminum;
2. quenching the alloy from a temperature above 900°C at a cooling rate of higher than 10°C/minute in a temperature range of 830°C to 900°C;
3. tempering the quenched alloy at a temperature of 480°C to 750°C; and
4. plasticially deforming the tempered alloy at a temperature of 550°C to 780°C.

3,944,446

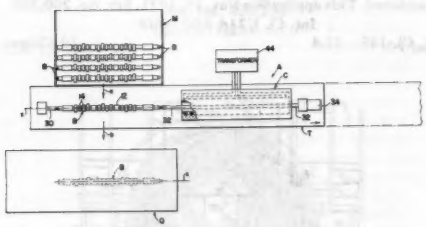
METHOD OF INDUCTIVELY HEATING AND QUENCH HARDENING CAMSHAFTS

Lee M. Bober, Newburgh Heights, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed May 22, 1975, Ser. No. 580,064

Int. Cl.² C21D 9/30

U.S. Cl. 148—131 **4 Claims**



1. A method of inductively heating and quench hardening an elongated camshaft having a central axis, an elongated body portion, at least three axially spaced bearings on said body portion and having bearing surfaces generally concentric with said axis and axially spaced cams on said body portion and having cam surfaces encircling said axis, said method comprising the steps of:

a. providing a generally cylindrical multi-turn inductor having an elongated workpiece receiving opening extending in a given direction;

b. rotatably mounting said camshaft in said workpiece receiving passage with said central axis extending in said given direction;

c. rotating said workpiece about said given axis;

d. energizing said inductor with a high frequency alternating current while said workpiece is rotating;

e. continuing said energizing and rotating steps until said surfaces are inductively heated to a temperature above a quench hardening temperature and a part of said body portion is below a quench hardening temperature;

f. then removing said workpiece from said workpiece receiving opening;

g. before said surfaces cool below the quench hardening temperature, clamping said workpiece on at least three of said bearing surfaces for rotation about a quench axis corresponding to said workpiece central axis;

h. restraining said at least three clamped bearing surfaces from transverse movement;

i. before said surfaces cool below the quench hardening temperature, quenching said clamped and restrained workpiece with a quenching liquid until said surfaces are quenched to a temperature before the hardening temperature; and,

j. rotating said clamped and restrained workpiece about said quench axis during said quenching step.

3,944,447

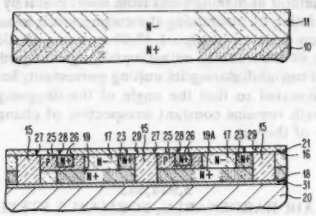
METHOD FOR FABRICATION OF INTEGRATED CIRCUIT STRUCTURE WITH FULL DIELECTRIC ISOLATION UTILIZING SELECTIVE OXIDATION

Ingrid E. Magdo, and Steven Magdo, both of Hopewell Junction, N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Mar. 12, 1973, Ser. No. 340,150

Int. Cl.² H01L 21/20, 21/76, 27/02

U.S. Cl. 148—175 **9 Claims**



1. A method for fabricating an integrated circuit structure with full dielectric isolation comprising

epitaxially depositing a layer of low conductivity silicon having a conductivity-determining impurity concentration $<2 \times 10^{16}$ atoms/cm³ on a silicon substrate having a conductivity-determining impurity concentration $>3 \times 10^{18}$ atoms/cm³,

forming an oxidation resistant protective layer over discrete spaced areas in said silicon layer,

etching recesses in and thermally oxidizing the unprotected areas in said silicon layer to form silicon dioxide regions coextensive with and surrounding said spaced silicon areas and extending from said substrate through said silicon layer to the protected surface of said spaced silicon areas,

forming a layer of dielectric material on said silicon layer,

depositing a layer of polycrystalline silicon on said dielectric layer,

removing said silicon substrate by preferential electrochemical anodic etching to provide spaced silicon pockets in said silicon layer, each respectively enclosed by silicon dioxide regions and said dielectric surface, and

forming semiconductor devices in said pockets by the selective introduction of conductivity-determining impurities into the surface of said pockets exposed by the removal of said silicon substrate.

3,944,448

THIXOTROPIC MONOPROPELLANT CONTAINING INORGANIC PHOSPHIDES OR PHOSPHIDE ALLOYS

Bernard Marlowe, Malvern, Pa., and Stanley Tannenbaum, Morristown, N.J., assignors to Thiokol Corporation, Bristol, Pa.

Filed Apr. 22, 1964, Ser. No. 363,335
Int. Cl.² C06D 5/10
U.S. Cl. 149—22 17 Claims

1. Novel thixotropic, monopropellant compositions comprising a mixture of a solid fuel selected from the group consisting of inorganic phosphides, phosphide alloys and mixtures of these inorganic phosphides and phosphide alloys, a liquid oxidizer selected from the group consisting of nitric acid, nitric acid enriched with NO_2, nitric acid enriched with NO_2 and HF, nitrogen tetroxide, hydrogen peroxide, perchloryl fluoride, tetrafluorohydrazine, tetranitro methane and perchloric acid, and a thixotropic agent selected from the group consisting of particulated carbon and silica.

3,944,449

METHOD OF PRODUCING TARNISH RESISTANT COPPER AND COPPER ALLOYS AND PRODUCTS THEREOF

Elmer J. Caule, New Haven, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 177,291, Sept. 2, 1971, Pat. No. 3,764,399, which is a continuation-in-part of Ser. Nos. 59,684, July 30, 1970, Pat. No. 3,677,828, and Ser. No. 67,943, Aug. 28, 1970, Pat. No. 3,716,427, which is a continuation-in-part of Ser. No. 59,684,. This application Mar. 15, 1973, Ser. No. 341,513
Int. Cl.² C23F 7/12
U.S. Cl. 156—316 11 Claims

1. A method of producing a flexible laminate, comprising:
A. providing a material selected from the group consisting of copper foil and copper sheet,
B. applying to a surface of said material a phosphoric acid solution of at least 8 percent concentration and containing from 3.5 grams per liter up to the solubility limit of a material selected from the group consisting of sodium dichromate and potassium dichromate and mixtures thereof, for at least 2 seconds, to form a uniform, glassy-like, substantially pore-free coating of copper phosphate from 20 to 1000 Angstroms thick, provided that when the concentration of phosphoric acid is increased, the minimum dichromate concentration is proportionately increased,
C. rinsing said material for at least two seconds in water at a pH of from about 4.9 to 6.3 and at a temperature from about 90° C up to the boiling point,
D. drying said material, and
E. adhesively laminating a plastic film to said surface.

6. A method of producing a flexible laminate comprising:
A. providing a material selected from the group consisting of copper foil and copper sheet,
B. oxidizing a surface of said material to form a surface oxide film from 150 to 1000 Angstrom units in thickness,
C. applying a phosphoric acid solution to said oxide film to form thereon a uniform, glassy-like, substantially pore-free coating of copper phosphate,
D. rinsing said material for at least two seconds in water at a pH of from about 4.9 to 6.3 and at a temperature from about 90° C up to the boiling point,
E. drying said material, and
F. adhesively laminating a plastic film to said surface.

3,944,450

METHOD OF PRODUCING TANTALUM DRY-ELECTROLYTIC CAPACITORS

Werner Schnabel, Nattheim, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 15, 1973, Ser. No. 415,998
Claims priority, application Germany, Nov. 21, 1972, 2257063
Int. Cl.² B05D 5/12
U.S. Cl. 156—3 8 Claims

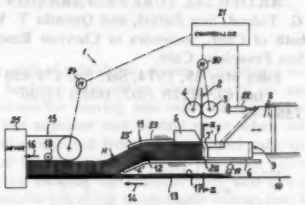
1. A method of producing a tantalum dry-electrolytic capacitor comprising a sintered tantalum anode, oxidized to form a dielectric layer, and a semiconducting manganese dioxide cathode layer which is coated with a graphite layer serving as current supply, characterized in that after the formation of the manganese dioxide layer a thin layer of manganese dioxide is removed from the surface thereof by chemical treatment in an acetic acid-hydrogen peroxide bath, following which the cathode is coated with said graphite layer.

3,944,451

METHOD OF AND APPARATUS FOR MAKING A PLUSH-TYPE CLOTH

Pierre Jean Marc Partensky, Lyon, France, assignor to Societe Anonyme dite B.T.B. Benoit le Tapis Brosse, Lyon, France

Filed July 8, 1974, Ser. No. 486,512
Claims priority, application France, July 10, 1973, 73.26386
Int. Cl.² D04H 11/00
U.S. Cl. 156—72 2 Claims



1. An apparatus for making a nonwoven plush-type cloth, said apparatus comprising:
a generally horizontal guide having a horizontal upper guide element and a lower guide element spaced vertically apart by a predetermined distance, said guide having an upstream end and a downstream end,
feed means for advancing a web downwardly toward said upstream end,
cutting means at said upstream end for severing from said web sections having a length slightly greater than said distance and for pushing the cut sections into said upstream end of said guide to form therein a stack, whereby said stack is displaced horizontally toward said downstream end by an increment each time a new cut section is pushed into said upstream end; and
compression means at said downstream end for pressing said sections as they emerge therefrom endwise down into an adhesive coated substrate, said cutting means including a blade horizontally displaceable across said upper guide element and forming therewith a shear, said feed means advancing said web downwardly in increments equal to said length said guide being spaced above and parallel to said substrate at said upstream end and said downstream end being turned downwardly toward said substrate, means for coating said substrate with an adhesive and means for advancing said substrate so coated past said downstream end of said guide, said compression means at said downstream end including a horizontal

support for said substrate and a band spaced above said support and driven at substantially the same speed as the advance speed of said substrate.

2. A method of making a plush-type cloth, said method comprising the steps of:

a. advancing a substrate along a horizontal path;

b. applying an adhesive layer to the upper surface of said substrate;

c. advancing a web of plush-forming material downwardly toward said layer in a vertical direction;

d. intercepting the leading lower edge of said web above said adhesive layer on a horizontal guide prior to engagement of said web with said surface;

e. severing a section from said web by displacing a blade horizontally above said guide and against an upper horizontal guide forming a counterblade, said guides defining a horizontal channel spaced above but parallel to said substrate;

f. pressing the cut section into said channel, thereby forming a succession of cut sections in the form of a horizontal stack within said channel;

g. deflecting said stack downwardly toward said adhesive layer with said sections substantially perpendicular to said substrate;

h. pressing said sections applied to said adhesive layer into the latter to implant the respective lower edges of said sections therein by passing said sections between a belt spaced above and parallel to said substrate; and

i. setting said adhesive layer.

3,944,452

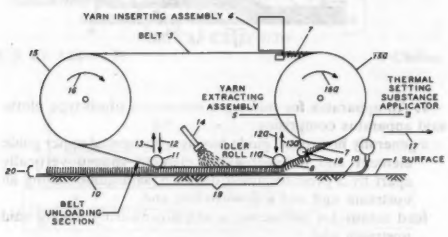
ARTIFICIAL TURF PREPARATION

William G. Toland, San Rafael, and Quentin T. Woods, San Jose, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed May 29, 1974, Ser. No. 474,458

Int. Cl.² B32B *5/02*; D04H *11/00*

U.S. Cl. 156—72 **8 Claims**



1. A process for continuous field preparation of a fibrous turf on the ground using a wheeled vehicle which is moved forward at a ground speed and which has a continuous rotatable belt operably connected to the vehicle, which process comprises:

a. inserting fibers into the continuous rotatable belt, the belt being adapted to have fibers inserted therein, to obtain a belt with inserted fibers;

b. laying a receiving matrix on the ground;

c. bringing a portion of the belt with inserted fibers into connection with the receiving matrix as the vehicle moves forward so as to immerse the inserted fibers in the matrix;

d. operating the belt member of the moving vehicle similar to a tank tread; and

e. maintaining said portion of the belt in zero relative velocity to the ground, by rotating the belt by drive wheels at a speed equal to the ground speed of said vehicle, for a sufficient period of time so that the fibers will stay in the matrix upon removing the backing from the fibers.

3,944,453

HOSE CONSTRUCTION

Anil H. Chudgar; Richard L. Fischer, and Marvin E. Holmgren, all of Manitowoc, Wis., assignors to Imperial-Eastman Corporation, Chicago, Ill.

Filed July 5, 1974, Ser. No. 485,895

Int. Cl.² C21D *1/18*

U.S. Cl. 156—143 **18 Claims**

1. The method of forming a hose comprising the steps of: providing a thermoplastic core tube defining an outer surface portion; providing a thermoplastic layer about said core tube; thermally forming a fused bonding layer of said outer surface portion and said thermoplastic layer; applying a fibrous reinforcement layer about the tube to cause the surface fibers thereof to be embedded in the fused bonding layer; and cooling the fused bonding layer to form concurrently a set thermal weld inner portion autogenous with the core tube and a set outer portion mechanically interlocked to said inner surface fibers of the reinforcement layer, said inner and outer portions being substantially continuous.

3,944,454

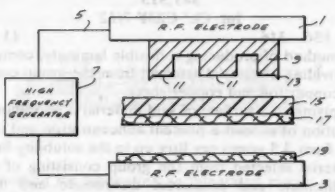
HEAT-BONDING METHOD

Joanne Burgheimer, White Plains, N.Y., assignor to The Dimension Weld International Corporation, Stamford, Conn.

Filed June 25, 1974, Ser. No. 483,066

Int. Cl.² B32B *31/06*; C09J *7/00*; H05B *9/04*

U.S. Cl. 156—273 **12 Claims**



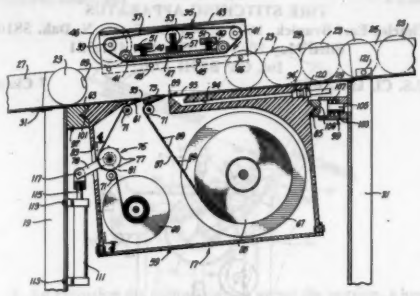
1. A method of heat-bonding a layer of thermoplastic material onto a densely woven synthetic fabric which has a higher melting point than said thermoplastic material and is impenetrable to the latter even when said thermoplastic material is in flowable state, comprising the steps of forming an assembly from a layer of thermoplastic material and a juxtaposed densely woven synthetic fabric having a surface facing the thermoplastic material and another surface facing away therefrom, said fabric also having a higher melting point than said thermoplastic material and interstices which are impenetrable to said thermoplastic material even when the latter is in flowable state; subjecting said assembly to pressure in bonding zones in which said layer is to be bonded to said fabric; subjecting said assembly to a dielectric field so as to apply in said zones sufficient heat to said assembly to render said thermoplastic material flowable; and establishing adjacent said other surface of said synthetic fabric a dielectric resistance greater than the dielectric resistance of said synthetic fabric so as to cause heating of said synthetic fabric to an extent adequate to render the same sufficiently flowable in said zones to bond with said thermoplastic material.

3,944,455

LABELLING SYSTEM AND CASSETTE LABEL APPLICATOR USABLE THEREWITH

John B. French, Hacienda Heights, Calif., assignor to Compac Corporation, Netcong, N.J.

Filed Sept. 27, 1973, Ser. No. 401,161
Int. Cl.² B65C 9/42, 9/04, 9/18; B65H 25/00
U.S. Cl. 156—361 13 Claims



11. A cassette label applicator for applying labels to articles wherein the labels are supplied on a backing strip and the label applicator is drivingly connectable to a motor, said label applicator comprising:

a supporting structure;

a supply reel mounted for rotation on the supporting structure and adapted to have the backing strip wound thereon;

a takeup reel mounted for rotation on the supporting structure, said backing strip adapted to extend from the supply reel to the takeup reel and to be wound on the takeup reel;

drive means mounted on the supporting structure for movement relative thereto and cooperable with the backing strip to move the backing strip from the supply reel to the takeup reel;

means for releasably drivingly connecting the driving means to the motor whereby the motor can drive the drive means;

means for removing the labels from the backing strip as the backing strip moves between said reels;

vacuum means for releasably retaining the removed labels at a preselected location, the articles being adapted to receive the labels from said preselected location whereby such articles are labelled; and

means on said supporting structure for releasably mounting the cassette label applicator on a support.

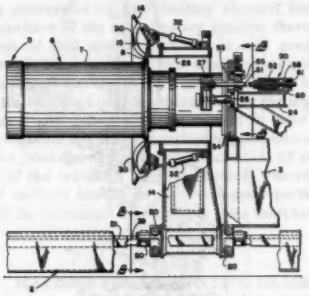
3,944,456

TIRE BUILDING MACHINE

Armindo Cantarutti, Akron, Ohio, assignor to NRM Corporation, Akron, Ohio

Filed May 6, 1974, Ser. No. 467,382
Int. Cl.² B29H 17/12, 17/22
U.S. Cl. 156—398 15 Claims

1. In a tire building machine, an expandable tire building drum having tire bead carriers mounted for movement toward and away from opposite ends of said drum, means for expanding and contracting said drum, said tire bead carriers including means for supporting the tire beads radially outwardly of the drum ends when the drum is contracted, and means for synchronously moving said tire bead carriers symmetrically about the centerline of said drum to position the tire beads at the desired location over the ends of said drum and holding the tire beads in place during expansion of said drum, said means for synchronously moving said tire bead carriers symmetrically about the centerline of said drum comprising a pair of carriages for said tire bead carriers, means mounting said carriages for movement toward and away from opposite ends of said drum, a rack and pinion mechanism for synchronizing the movements of said carriages in opposite directions, and control means for moving said carriages to the desired extent for positioning the tire beads at the desired location over the ends of said drum and holding the tire beads in place during expansion of said drum as aforesaid, said rack and pinion mechanism comprising a stationary housing located intermediate said carriages, a pinion rotatably mounted in said housing, and a pair of racks engaging opposite sides of said pinion, one of said racks being connected to one of said carriages and the other of said racks being connected to the other of said carriages for causing said carriages to move axially toward and away from each other to the same extent, one of said carriages being part of an inboard assembly at one end of said drum and the other of said carriages being part of an outboard assembly



at the other end of said drum, means providing a releasable connection between said other carriage and its associated rack, and means for moving said other carriage toward and away from the adjacent end of said drum when said other carriage is disconnected from its associated rack to permit placement of the tire beads on said tire bead carriers and removal of the finished tire carcass from said tire building drum, said means providing a releasable connection between said other carriage and its associated rack comprising a yoke on said other carriage for receipt of a reduced end portion on its associated rack, a roller extending between the arms of said yoke for engaging the bottom surface of said reduced end portion, an aperture in said reduced end portion, and a pin on said carriage movable into and out of said aperture in said reduced end portion for locking and releasing said other carriage from its associated rack.

3,944,457

STRIP MATERIAL APPLYING DEVICE

Richard T. Podvin, Fridley, and Thomas F. Look, New Brighton, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 29, 1974, Ser. No. 501,609
Int. Cl.² B29H 17/02, 21/02
U.S. Cl. 156—405 14 Claims

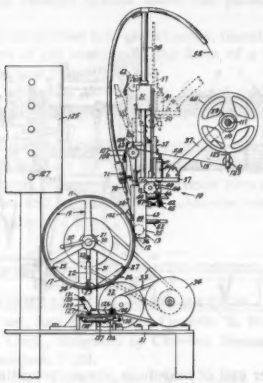
1. In a device adapted for adhesively applying lengths of elastic reflex-reflective strip material to tire casings, comprising means adapted for driving a said tire casing along a tire casing path past an applying station; a head assembly including a frame, an applying wheel rotatably mounted on said frame, and means for defining a path for said strip material along said frame including means for defining a path portion relative to said frame partially around said applying wheel; and means mounting said head assembly for movement between a first position spaced from said applying station and an applying position with said wheel positioned to press strip material along the path portion thereon against the tire casing at said applying station to apply strip material as the tire casing

is driven past the applying station: the improvement wherein said device includes

solvent applicating means along said tire casing path for applying to said casing a solvent capable of affording adhesive contact between said tire casing and said strip material;

severing means along the path for said strip material and spaced from said applying wheel for severing said strip material along said path;

advancing means for advancing an end of said strip material from said severing means to said path portion on said applying wheel comprising a wall in said head assembly along said path in advance of said severing means adapted to support one surface of said strip material, an advance block including means adapted for engagement with said



strip material, and means for mounting said advance block for movement sequentially (1) from a disengaged position spaced from strip material along said wall to a position with said engagement means engaged with said strip material, (2) along said wall toward said severing means with the engagement means of said block engaged with said strip material for a distance sufficient to move an end of the strip material from said severing means to said applying wheel, and (3) back to said disengaged positions;

positioning means for moving said head assembly between said first and applying positions;

tensioning means along said path for providing a uniform predetermined tension in strip material moving along said path at said applying wheel; and

a control system for sequentially operating said device including:

means for operating said advancing means to move said advance block from said engage position along said wall to advance an end of said strip material from said severing means to said applying wheel and for then returning said advance block to said disengage position;

means for activating said positioning means to move said head to its applying position after the end of said strip material is at said applying wheel;

means for activating said solvent applicating means for a time sufficient to apply solvent entirely around the tire casing prior to movement of said head to its applying position;

means mounted along said casing path when said head is in said applying position adapted for sensing the end of a length of said strip material applied on a said tire casing driven past said sensing means and for producing a signal in response thereto;

means for receiving said signal and activating said severing means at a predetermined time after said signal is received to provide a desired relationship between the ends of the applied strip material; and

means for operating said positioning means to return said head assembly to its first position after the operation of said severing means.

3,944,458

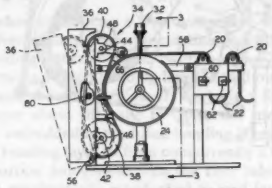
TIRE STITCHING APPARATUS

Charles Earl Branick, 1601 S. 9th St., Fargo, N. Dak. 58102

Filed May 20, 1974, Ser. No. 471,321

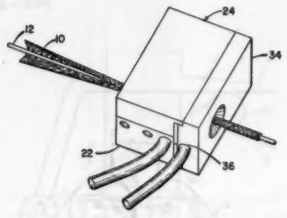
Int. Cl.[2] B29H *17/02*

U.S. Cl. 156—412 **7 Claims**



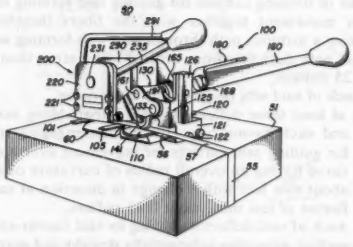
1. A tire stitching device including means for supporting a tire for rotation about a generally horizontal axis, a support frame mounted adjacent said tire and on one side thereof for pivotal movement between operative and inoperative positions and about an axis generally parallel to the rotational axis of the tire, first and second spaced apart roller means mounted on said support frame for rotation about axes generally parallel to the pivotal axis of said support frame, a resilient endless belt extending around said spaced apart roller means, said belt having a free span between said roller means, said support frame being located relative to said tire such that pivotal movement of said support frame into its operative position being effective to move the free span portion of said endless belt into engagement with the one side of said tire, means for rotating one of said tire and endless belt means, means for delivering a strip of tread material over the upper surface of said tire and from the side thereof opposite to said belt whereby said belt is engageable with said material after passage thereof over the upper end of said tire and to the one side thereof, said belt being wider than said strip material so that the side edges of said belt extend laterally beyond the edges of said strip material, said endless belt having a front face engaging said strip material when said support frame is in its operative position and a back surface which engages said first and second roller means, first support means mounted on said support frame and adjacent the front face of said endless belt and located adjacent the periphery of said tire between the points at which said endless belt and said strip material first engages said tire, first pressure roller means mounted on said first support means for engaging a center portion of said strip material when said support frame is moved into its operative position and for pressing the same into engagement with said tire at a point above a horizontal plane containing the rotational axis thereof and prior to the engagement of said endless belt with said tire, as said tire and strip material is rotated toward said endless belt, means associated with said first pressure roller means for effecting pressure engagement with said strip material, second supporting means mounted on said pivot frame and adjacent the back surface of said belt, second pressure roller means mounted on said second supporting means and engageable with said endless belt when said support frame is in its operative position for forcing the side portions of said belt into engagement with the side portions of said strip material and for pressing said strip material side portions into engagement with said tire.

3,944,459
METHOD AND APPARATUS FOR APPLYING REINFORCED INSULATION TO A CONDUCTOR
Max Skobel, Edison, N.J., assignor to Dow Corning Corporation, Midland, Mich.
Filed Dec. 4, 1974, Ser. No. 529,439
Int. Cl.² B31F 1/00
U.S. Cl. 156—461 1 Claim



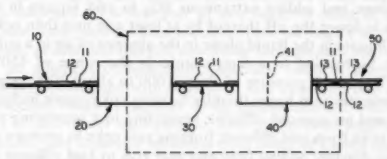
1. An extrusion die comprising an upper die portion, a lower die portion and an outer die portion, the upper die portion in superposed abutting relationship with the lower die portion and the lower die portion having a guider portion transversely located defining a guide tube and spaced from the remaining portion of the lower die portion to provide a part of a fabric receiving channel and the upper die having a portion spaced from the guider to provide the remaining part of the fabric receiving channel, the fabric receiving channel partially circumscribing the guide tube, the lower die having a first feed channel formed through a side edge thereof in right angle relation to the guide tube and opening into a chamber circumscribing a terminal end of the guide tube, the upper die portion and the lower die portion each having a forward edge, the outer die portion abutting the forward edges, having an exit aperture formed therethrough, whose axis is an extension of the axis of the guide tube and having a second feed channel formed through a side edge thereof extending into a chamber into which the exit aperture opens.

3,944,460
COMBINATION STRAPPING TOOL FOR PLASTIC STRAP
George A. Karr, Homewood, Ill., assignor to Interlake, Inc., Chicago, Ill.
Filed Dec. 14, 1972, Ser. No. 315,156
Int. Cl.² B65B 13/02
U.S. Cl. 156—494 17 Claims



1. Strapping apparatus for securing a length of plastic strap around an object, said apparatus comprising a frame, strap-gripping means mounted on said frame for holding the strap encircled in a loop in a tensioned condition about the object with the leading end of the strap overlapping and spaced from the supply portion thereof, two substantially parallel strap guides spaced apart longitudinally of said strap and disposed substantially normal to the longitudinal axis thereof, each of said strap guides being disposed in use between and for contact with both of the overlapping portions of the strap to maintain a predetermined separation therebetween and cooperating therewith and with each other to define a sealing region, a heating element movable in directions substantially normal to the longitudinal axes of the overlapped portions of the strap between a strapheating position and a retracted position, said heating element in the strap-heating position thereof being disposed in said sealing region between the overlapping portions of the strap for contact therewith to effect melting thereof, said heating element in the retracted position thereof being displaced from between the overlapping portions of the strap and out of contact therewith, bias means mounted on said frame and resiliently urging said heating element toward the retracted position thereof, actuating means mounted on said frame and releasably coupled to said heating element and movable in a predetermined direction for effecting movement of said heating element from the retracted position to the strap-heating position thereof, further movement of said actuating means in said predetermined direction effecting release of said actuating means from said heating element thereby to permit return of said heating element to the retracted position thereof under the urging of said bias means, and pressure means carried by said frame for pressing together the melted overlapping portions of the strap to effect a joint therebetween after the return of said heating element to the retracted position thereof, whereby there is provided uniform heating of the overlapped portions of the strap and the formation of a uniform joint therebetween.

3,944,461
MACHINE FOR LAMINATING GLASS
Bernard L. Ogron, Morton Grove, Ill., assignor to Globe Glass & Trim Company, Ill.
Filed Nov. 18, 1974, Ser. No. 524,473
Int. Cl.² B32B 17/10; C03C 27/12
U.S. Cl. 156—538 13 Claims



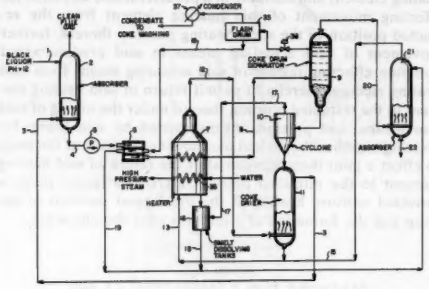
1. A machine for continuously laminating flexible film onto a succession of glass substrates comprising:
first conveyor means, adapted to receive a succession of glass substrates, and to transport said glass substrates along a horizontal plane;
substrate preparation means, cooperating with said conveying means, for receiving therefrom said succession of glass substrates and washing one surface thereof;
application means, adapted to continuously unroll a quantity of flexible film having a pressure sensitive adhesive surface, said application means exposing said pressure sensitive adhesive surface of said flexible film along a predetermined application line on said horizontal plane; and
guide means, for alignably transporting said succession of glass substrates from said substrate preparation means to said predetermined application line, said guide means including roller means adapted to facilitate the movement of glass substrates along said guide means, and said roller means, at the area of contact with said succession of glass substrates, having a greater cross-sectional dimension than the cross-sectional dimension of said roller means at substantially all areas below said area of contact, whereby said flexible film is continuously laminated onto one surface of each of a succession of glass substrates.

3,944,462

COKING OF WASTE KRAFT PULPING LIQUORS AT LOWERED PH

Howard V. Hess, Glenham; Edward L. Cole, Fishkill, and William F. Franz, Gardiner, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 149,672, June 3, 1971, abandoned. This application Aug. 1, 1973, Ser. No. 384,672
The portion of the term of this patent subsequent to Sept. 17, 1991, has been disclaimed.
Int. Cl.[2] D21C *11/14*
U.S. Cl. 162—31 8 Claims



1. In combination in a process for treating alkaline Kraft pulping liquors, the steps of: flowing said liquors to an adsorbing zone and adding extraneous SO_2 to said liquors in said zone to lower the pH thereof by at least one unit then coking said liquors in the liquid phase in the absence of air in a coking zone by heating to a temperature in the range of 450° to 700°F. under a pressure of about 1000 to about 3000 psig for 0.5 minutes to 6 hours thereby forming coke, gases including H_2S and an aqueous effluent; separating in a separating zone said coke from said effluent; burning said coke to produce said sulfur dioxide; adding lime and said H_2S to said effluent in a second absorbing zone to form new Kraft cooking liquor.

3,944,463

PULPING OF LIGNOCELLULOSIC MATERIAL WITH OXYGEN IN TWO STAGES AT INCREASING PH

Hans Olof Samuelson, Goteborg; Leif Ake Smedman, Domsjoverken, and Erik Olof Sture Hagglund, Ornskoldsvik, all of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed Dec. 12, 1973, Ser. No. 424,148
Claims priority, application Sweden, Dec. 19, 1972, 16651/72
Int. Cl.[2] D21C *3/26*
U.S. Cl. 162—65 28 Claims

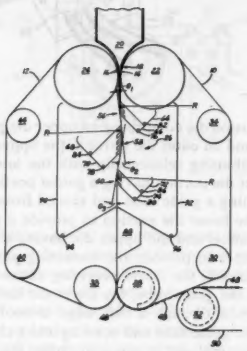
1. A process for preparing cellulose pulp which comprises pulping lignocellulosic material with oxygen under superatmospheric pressure in the presence of an alkaline compound in at least two oxygen pulping stages, in a first stage at a pH within the range from about 6 to about 9 and at a temperature within the range from about 110° to about 160° C; and in a second stage at a pH of at least about 10 and at a temperature within the range from about 80° to about 160° C; and continuing the pulping with oxygen under superatmospheric pressure at a temperature within the range from about 80° to about 160° C until cellulose pulp is obtained.

3,944,464

FORMING SECTION FOR TWIN-WIRE PAPERMAKING MACHINE

John A. Means, Norwalk, Conn., assignor to International Paper Company, New York, N.Y.

Filed May 10, 1974, Ser. No. 468,732
Int. Cl.[2] D21F *1/00*
U.S. Cl. 162—273 5 Claims



1. In a web-forming machine having means for passing a water suspension of fibers between a pair of endless foraminous forming carriers supported under tension for movement over respective paths into and through a web-forming section, the improved web-forming section comprising

A. a plurality of sets of deflectors disposed with alternate sets spaced apart along said path on opposite sides of said pair of forming carriers for guiding said forming carriers for movement together with the fibers therebetween along a tortuous path through said web-forming section, said path deviating from vertical by no more than about 0.25 radians,

B. each of said sets of deflectors comprising

1. at least three deflectors spaced apart along said path and each having respective carrier-engaging surfaces for guiding said carriers for movement over a convex curve having an overall radius of curvature of at least about two feet with a change in direction at each deflector of less than about 0.05 radians,

2. each of said deflectors having its said carrier-engaging surface extending substantially straight and perpendicular to the direction of said path, and each of said deflectors extending away from said surface at an acute angle to the downstream direction of said path,

whereby the tension in the respective forming carrier on the outside at each such curve presses said forming carriers together to express water from said suspension through said forming carriers, said sets of deflectors removing water from the respective forming carrier on the inside at each such curve.

3,944,465

HEADBOX ASSEMBLY FOR A PAPERMAKING MACHINE

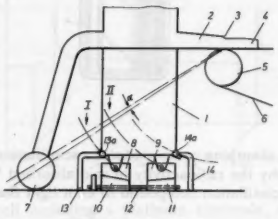
Karl Wolf, Heidenheim-Schnaitheim, Germany, assignor to E. I. Du Pont de Nemours and Company, Heidenheim (Brenz), Germany

Filed Apr. 22, 1974, Ser. No. 462,937

Claims priority, application Germany, Apr. 21, 1973, 2320312

Int. Cl.² D21F *1/06*

U.S. Cl. 162—336 5 Claims



1. Headbox assembly for a papermaking machine provided with a wire screen through which water from wet paper stock drains, the assembly comprising a headbox having a discharge nozzle for a jet of the paper stock, at least one forward and one rearward wedge member as viewed in feed direction of the stock jet from the discharge nozzle, said wedge members underlying said headbox and having respective wedge surfaces of different inclination, respective base members pivotally supporting said headbox and supportingly engaged by said wedge members respectively, and a threaded spindle whereon said wedge members are mounted in common, said spindle being actuable for adjusting the position of said wedges forward and rearward of said stock feed direction and accordingly of said headbox whereby said discharge nozzle thereof is adjustable relative to the wire screen of the machine.

3,944,466

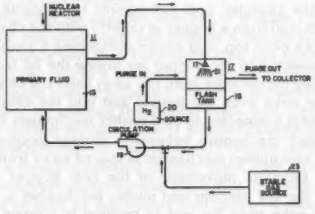
REDUCING CONCENTRATION OF GASES IN NUCLEAR REACTOR

Robert T. Marchese, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 16, 1973, Ser. No. 379,675

Int. Cl. F42b *19/32*

U.S. Cl. 176—37 3 Claims



1. The method of reducing, with apparatus including a flash tank, the concentration of radioactive gas resulting from fission in a nuclear reactor having a primary liquid to render said reactor accessible, the said radioactive gas including radioactive isotopes of xenon and krypton, the the said method comprising, increasing the concentration of said isotopes in said primary liquid by pumping a quantity of stable gas of the same atomic number as xenon and krypton into said primary liquid, said last-named quantity being large compared to the quantity of said radioactive isotopes included in said primary liquid, circulating said primary liquid continuously from said reactor through said flash tank then back through said reactor, and purging the resulting mixture of said radioactive isotopes and said stable gas from said flash tank.

3,944,467

SPACER FOR FUEL RODS IN NUCLEAR FUEL ELEMENTS

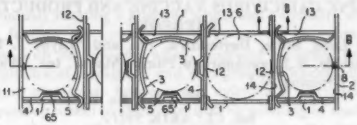
Willi Biermann, Bensberg-Refrath; Klaus Iversen, Rosrath near Cologne, and Johannes Lohe, Bensberg-Refrath, all of Germany, assignors to Interatom, International Atomreaktorbau GmbH, Bensberg, Cologne, Germany

Continuation of Ser. No. 77,212, Oct. 1, 1970, abandoned. This application June 11, 1973, Ser. No. 368,949

Claims priority, application Germany, Oct. 4, 1969, 1950179

Int. Cl.² G21C *3/18*

U.S. Cl. 176—78 8 Claims



1. Spacers for positively positioning fuel rods in nuclear reactor fuel elements including: a plurality of web plates disposed in orthogonally intersecting relation to other web plates and being joined along common contact surfaces to form a network of individual compartments for holding said fuel rods; said compartments being defined by two pairs of opposite walls having upper and lower portions; apertures formed in each of said web plates to thereby define a wall passage between adjacent compartments; first and second one piece resilient members; said resilient members, each being respectively disposed on a first pair of two adjacent sides of said opposite walls; said resilient members each having an integral segment at one end thereof, extending through said aperture into an adjacent compartment; said first resilient member being juxtapositioned with respect to said upper portion and said second resilient member being juxtapositioned with respect to said lower wall portion; first and second separator members; said separator members each being of a same material as said resilient members and juxtapositioned with respect to a second pair of two adjacent sides of said opposite walls and protuberances integral with said separator members extending into said apertures toward adjacent compartments and being in communication with said resilient member segments, said separator members being joined in said apertures with said resilient members at a point of contact formed between said protuberances and said segments.

3,944,468

FUEL PIN CLUSTER FOR A HIGH-POWER REACTOR

Georges Duret, Manosque; Georges Place, and Jean Rousseau, both of Aix-en-Provence, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 13, 1974, Ser. No. 442,244

Claims priority, application France, Feb. 19, 1973, 73.05828

Int. Cl.² G21C *3/12*

U.S. Cl. 176—81 1 Claim

1. A fuel-pin cluster for a nuclear reactor comprising a plurality of fuel-pins, a can for each of said pins, end-caps for each of said cans, a spacer element for each of said fuel-pins wound in coarse pitch helix on the external surface of the fuel-pin can and rigidly fixed to the end-caps of said can, said spacer element including a tube terminating short of said end caps having a constant initial cross section and having a ratio

of diameter to thickness at least equal to the ratio of diameter to thickness of the fuel-pin can and a reinforcement wire

mounted with clearance within said tube and extending over the entire length of said tube and means for rigidly securing the internal reinforcement wire to the end-caps.

3,944,469

FELINE CALICIVIRUS VACCINE AND PRODUCTION THEREOF

James Long Bittle, Doylestown, Pa., and Wayne J. Rubic, Titusville, N.J., assignors to Pitman-Moore, Inc., Washington's Crossing, N.J.

Filed Nov. 21, 1974, Ser. No. 525,689
Int. Cl.² A61K *39/12*
U.S. Cl. 195—1.3 **9 Claims**

1. A process of attenuating virulent feline calicivirus which comprises propagating said virus for at least 10 one- to six-day serial passages through feline tissue cultures in a nutrient fluid at an incubation temperature of about 30° ± 2°C.

3,944,470

STABILIZATION AND ENHANCEMENT OF ENZYMATIC ACTIVITY

Francis Louvaine Diehl, Wyoming; Eugene Zeffren, Montgomery, and Edward John Milbrada, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed June 29, 1973, Ser. No. 375,251
Int. Cl.² C07G *7/02*
U.S. Cl. 195—63 **6 Claims**

1. An enzyme composition having improved activity and stability in aqueous solution comprising:

a. an enzyme; and

b. an aminated polysaccharide selected from cellulose, hydroxyethylcellulose, methyl cellulose or starch having from about 0.01% to about 2% by weight of nitrogen in its elemental composition,

wherein the weight ratio of said aminated polysaccharide to said enzyme is in the range from about 500:1 to 1:1.

3,944,471

METHOD AND APPARATUS FOR DETECTING BIOLOGICAL ACTIVITY

John R. Waters, Towson, Md., assignor to Johnston Laboratories, Inc., Cockeysville, Md.

Filed June 7, 1974, Ser. No. 477,452
Int. Cl.² C12K *1/04*
U.S. Cl. 195—103.5 R **34 Claims**

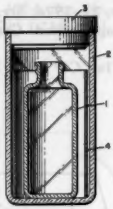
1. An apparatus for the analysis of materials, said apparatus comprising:

a first container adapted to receive a sample of said material together with a growth medium including a ^{14}C carbon containing carbon source which is fermentable to produce $^{14}CO_2$, said first container having removable sealing means operable to maintain a sterile environment within said first container;

a second container adapted to receive said first container, whereby said first container occupies a substantial portion of the availbable space within said second container;

closure means operable to seal said second container;

a paper disposed within the unoccupied portion of said second container, said paper having deposited thereon a



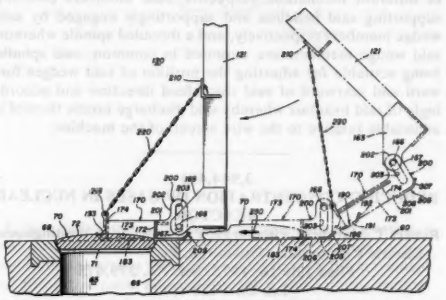
$^{14}CO_2$ absorbing compound and a scintillation compound, whereby the radioactivity of said absorbed $^{14}CO_2$ causes said scintillation compound to emit light flashes.

3,944,472

COKE OVEN LID PUSHER

Earl F. Lowe, Hendersonville, N.C., assignor to Interlake, Inc., Chicago, Ill.

Filed Apr. 15, 1974, Ser. No. 460,732
Int. Cl.² C10B *31/02*; B66C *13/00*
U.S. Cl. 202—262 **15 Claims**



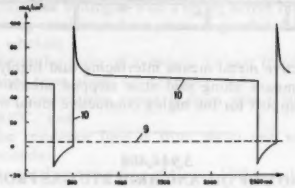
1. A device for positioning a lid for a coke oven charging port in the charging port subsequent to charging the coke oven with coal from a hopper in registry with the charging port in the coke oven top, said device comprising a pusher mechanism connected to the hopper for urging the lid from a position resting on the coke oven top away from the charging port along the coke oven top toward and into the charging port, and a motor connected to said pusher mechanism for moving said pusher mechanism between a storage position thereof wherein said pusher mechanism is spaced away from the coke oven to facilitate movement of the coal hopper and a use position thereof wherein said pusher mechanism is in contact with the coke oven top and in position to contact the lid to urge the lid toward and into the charging port, continued operation of said motor when said pusher mechanism is in the use position thereof causing sliding movement of said pusher mechanism and the lid in contact therewith toward the charging port until the lid is in position in the charging port, whereby a charging port lid removed from the charging port during charging of the coke oven with coal is rapidly positioned in the charging port by activation of said motor to move said pusher mechanism from the storage position thereof to the use position thereof.

3,944,473

METHOD FOR INFLUENCING AN ELECTROCATALYTIC REACTION PROCEEDING AT AN ELECTRODE

Gustaaf Frans Josef Spaepen, Dessel, and Jan-Baptist Hugo Vandenborre, Kasterlee, both of Belgium, assignors to Studiecentrum Voor Kernenergie, S.C.K., Brussels, Belgium

Filed May 23, 1974, Ser. No. 472,844
Claims priority, application Belgium, May 30, 1973, 800271
Int. Cl.² C25B *3/02*, *15/02*
U.S. Cl. 204—79 20 Claims



1. In a cell including a platinum electrode, a counter-electrode and a reference electrode positioned in an alkaline medium including methanol, said platinum electrode being negative with respect to said reference electrode and positive with respect to said counter-electrode, the method of influencing the oxidation of methanol at said platinum electrode comprising the step of superimposing between said platinum and reference electrodes cathodic potential pulses having a polarity such that said platinum electrode is rendered more negative with respect to said reference electrode, each of said pulses having an amplitude in the range 500 to 1,000 millivolts and a duration in the range 10 to 500 milliseconds, the time interval between two successive pulses being in the range of 10 to 50 times the duration of one pulse.

3,944,474

ELECTROLYTIC MANUFACTURE OF CHLORINE AND SODIUM CARBONATE

Jean Verlaeten, Brussels, Belgium, assignor to Solvay & Cie., Brussels, Belgium

Filed Sept. 11, 1974, Ser. No. 505,091
Claims priority, application France, Sept. 11, 1973, 73.32710
Int. Cl.² C25B *1/14*, *1/16*, *1/26*
U.S. Cl. 204—87 20 Claims

1. A method for making chlorine and sodium carbonate comprising, in combination:

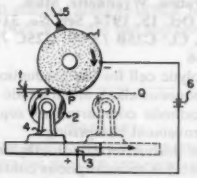
1. electrolyzing an aqueous solution of sodium chloride in at least one diaphragm cell to form a caustic brine,
2. carbonating and then further treating the caustic brine leaving the cell in a soda plant without ammonia by (a) treating the caustic brine in at least one monocarbonation scrubber by reacting the caustic brine with a gas having a low carbon dioxide content without causing bicarbonate precipitation in the monocarbonation scrubber to form a monocarbonated caustic brine, and (b) treating the monocarbonated caustic brine in at least one bicarbonation column by reacting at least part of it with gas rich in carbon dioxide to precipitate sodium bicarbonate in the bicarbonation column and to form a mother liquor,
3. separating the precipitated sodium bicarbonate from the mother liquor by filtration,
4. de-bicarbonating the separated mother liquor by converting the dissolved bicarbonate to carbonate,
5. saturating the de-bicarbonated mother liquor with respect to sodium chloride, and
6. treating the saturated liquor in an ammonia-soda process for making sodium carbonate and using the saturated liquor as at least a partial source of sodium chloride for such process.

3,944,475

ELECTROLYTIC GRINDING METHOD

Yasushi Mizuhara, Kamakura; Tsuwao Abe, and Hiroyuki Hitomi, both of Kawasaki, all of Japan, assignors to Hitachi Seiko Ltd., Japan

Filed Jan. 26, 1973, Ser. No. 326,843
Int. Cl.² B23P *1/10*
U.S. Cl. 204—129.46 5 Claims



1. In an electrolytic grinding method including the steps of continuously rotating a grinding wheel and a cylindrical workpiece, feeding the cylindrical workpiece to be in engaging relation with the grinding wheel, applying a voltage between said cylindrical workpiece and said grinding wheel, and supplying an electrolyte between said cylindrical workpiece and said grinding wheel to effect electrolytic grinding of said cylindrical workpiece, the improvement comprising the steps of:

mounting said cylindrical workpiece prior to said step of feeding at a positional relation to said grinding wheel such that the tangential lines to said workpiece and said grinding wheel extending in the feeding direction of said workpiece and closer to said grinding wheel and workpiece respectively are spaced with respect to each other towards the centers of said grinding wheel and workpiece respectively at a distance corresponding to a predetermined depth to be cut-off of said workpiece, and

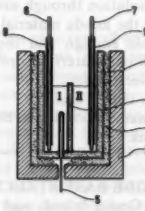
electrolytically grinding with said grinding wheel the entire outer peripheral surface of said rotating cylindrical workpiece to said predetermined depth by feeding said rotating cylindrical workpiece along said feeding direction parallel to said tangential lines.

3,944,476

PROCESS FOR DESULFURIZING MOLTEN METALS

Christian Gatellier, Montigny-les-Metz, and Michel Olette, Moulins-les-Metz, both of France, assignors to Institut de Recherches de la Siderurgie Francaise, Saint-Germain-en-Laye, France

Filed May 20, 1974, Ser. No. 471,730
Claims priority, application France, May 21, 1973, 73.18328
Int. Cl.² C25F *1/00*
U.S. Cl. 204—140 9 Claims



1. A process for decreasing the sulfur content of a metal that is liquid at a high temperature which comprises passing a direct electric current between two electrodes, one of which consists of a solid refractory metal oxide having an anionic conductivity through oxygen (O^{--}) ions that are present therein and cationic activity through the presence of cations that are present therein which are capable of reacting with sulfur, the said electrode of the refractory metal oxide con-

taining a fluoride of an alkali metal or alkaline-earth metal, in which process the metal to be desulfurized forms the negative electrode of the electrochemical cell that is thus produced.

3,944,477

DIAPHRAGM FOR ELECTROLYTIC CELL FOR CHLORINE PRODUCTION

Shyam D. Argade, Woodhaven, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 15, 1974, Ser. No. 514,658
Int. Cl.² C25B *13/00*; C25C *7/04*
U.S. Cl. 204—266 **7 Claims**

1. In an electrolytic cell for the production of halogen and caustic from an aqueous alkali metal halide solution containing anode and cathode compartments separated by a diaphragm, the improvement comprising:

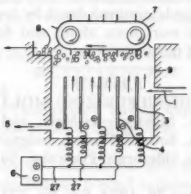
a diaphragm of porous tetrafluoroethylene polymer sheet material which has an amorphous content not exceeding about 5 percent and a micro-structure characterized by nodes interconnected by fibrils, said fibrils having a diameter of about 5 to about 1,000 angstroms, said nodes having lengths of about 0.5 to about 400 microns, said sheet having a porosity of about 50 to about 90 percent, a bulk density of less than about 1.0 and a bulk tensile strength of greater than about 3,000 pounds per square inch.

3,944,478

ELECTROLYTIC DRAINAGE TREATING APPARATUS

Yoichi Kuji; Tuyoshi Kato, and Nagao Saito, all of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 2, 1974, Ser. No. 466,192
Claims priority, application Japan, May 2, 1973, 48-49570; May 19, 1973, 48-46175; May 23, 1973, 48-57516; July 4, 1973, 48-75480; July 6, 1973, 48-76864
Int. Cl.² C02B *1/82*; B01K *5/00*; C02C *5/12*
U.S. Cl. 204—275 **27 Claims**



1. An electrolytic drainage treating apparatus comprising:

a high speed electrolyzer comprising an anode and a cathode with a thin gap therebetween,

means for forcibly passing at a high velocity a drainage as an electrolytic solution through said gap,

means for eluting the anode material as ions,

the gap being thin enough and the velocity being high enough to wash out materials formed between the electrodes by the electrolysis,

the gap being less than 1 mm.,

whereby contaminated materials in the drainage are flocculated by the ions.

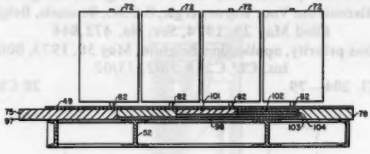
3,944,479

ANODE BASE STRUCTURE

Walter W. Ruthel, Grand Island, and Leo G. Evans, Tonawanda, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Jan. 3, 1974, Ser. No. 430,440
Int. Cl.² C25B *9/02*
U.S. Cl. 204—297 R **10 Claims**

1. An anode base structure for use in an electrolytic cell comprising a highly conductive metal means and a conductive metal means, said highly conductive metal means having a substantially continuous flat and level surface, said highly conductive metal means having a vertical cross-sectional shape of a substantially stair-stepped, truncated, right triangle,



said conductive metal means interfacing said highly conductive metal means along said stair stepped area to provide structural support for the highly conductive metal means.

3,944,480

PRODUCTION OF OIL AND HIGH BTU GAS FROM COAL

Wilburn C. Schroeder, 7316 Radcliffe Drive, College Park, Md. 20740

Filed Mar. 29, 1974, Ser. No. 456,163
The portion of the term of this patent subsequent to July 9, 1991, has been disclaimed.
Int. Cl.² C10G *1/06*
U.S. Cl. 208—10 **14 Claims**

1. A process for hydrogenating coal to provide hydrocarbon oil and gas products, comprising: hydrogenating said coal in the substantial absence of externally supplied liquid slurrying medium in a hydrogenation zone of a closed cyclic system, said system being maintained under hydrogenation pressure, with hot recycled hydrogen-containing gases and with added hot hydrogen-containing gases generated by reaction of coal at system pressure with oxygen and steam to provide an effluent stream containing excess hydrogen and liquid and gaseous hydrocarbons, removing liquid hydrocarbon products from said effluent stream without substantial reduction in system pressure, purifying the resulting effluent gas stream to remove H_2S, CO_2 and NH_3 without substantial reduction in system pressure, separating hydrocarbon gases from the hydrogen of the purified gas stream without substantial reduction in the hydrogen pressure to provide a gaseous hydrocarbon product of high Btu content, and recycling the resultant hydrogen stream through the closed system to said hydrogenation zone.

14. A process for producing hydrocarbon oils and gases of high Btu content from coal comprising: continuously feeding coal in the substantial absence of externally supplied liquid slurrying medium under gas pressure into a closed pressurized system maintained under hydrogenation pressure and having a coal gasification zone and first and second hydrogenation zones, feeding part of the coal to the coal gasification zone and reacting it with oxygen and steam to produce hot hydrogen-containing gases, feeding another part of said coal to the first hydrogenation zone along with a portion of said hot hydrogen-containing gases, hydrogenating said coal in said first hydrogenation zone with said hydrogen-containing gases and with recycle hydrogen from the closed system to provide an effluent stream containing hydrogen, hydrocarbon oils and gases and residual tars and solids, separating said residual tars and solids from the effluent stream and hydrogenating them in said second hydrogenation zone with another portion of the hot hydrogen-containing gases from the coal gasified and with recycle hydrogen from the system to provide a second hydrocarbon-containing effluent stream, combining the two effluent streams and removing hydrocarbon oils from the combined stream without reducing the pressure on the system, purifying the resulting gaseous stream to remove H_2S, CO_2 and NH_3 without substantial pressure reduction, separating gaseous hydrocarbons from the hydrogen in said purified gaseous stream without substantial pressure reduction on the system and recycling the hydrogen to the hydrogenation zones of the closed system.

3,944,481

CONVERSION OF CRUDE OIL FRACTIONS TO OLEFINS

Milton Silas Wing, Lake Jackson, and Billy Duane Head, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 5, 1973, Ser. No. 413,106
Int. Cl.² C10G 37/04; C07C 3/08
U.S. Cl. 208—61 9 Claims

1. A process for the production of an ethylene-propylene product which comprises:

A. hydrocracking a crude oil fraction boiling in the range from 200° to 1000°F. by contacting a mixture of said fraction and hydrogen with a highly active sulfided hydrocracking catalyst under a pressure greater than about 400 psig wherein

1. the molar ratio of hydrogen to said fraction is in the range from about 4:1 to about 50:1;
2. the temperature range is from about 300° to about 565°C.; and
3. the residence time is from about one to about 180 seconds;
4. the catalyst comprises of Group VIII metal, a Group VI B metal, or mixtures thereof and a halogen supported on a catalyst support of silica-alumina mixtures, or a natural or synthetic faujasite;
5. conditions (1) – (3) are selected so as to produce a C_2 – C_5 product in a yield of 91–95% and to achieve a normal paraffin to isoparaffin molar ratio greater than about 3:1 in the C_3 – C_5 portion of the hydrocracked product;

B. separating the hydrocracked product of step (A) to recover a C_2 – C_5 alkane product;

C. thermally cracking the C_2 – C_5 product and

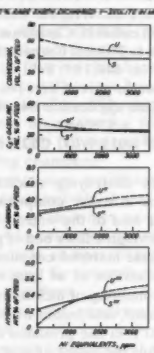
D. recovering ethylene and propylene as co-products.

3,944,482

PROCESS FOR THE CRACKING OF HIGH METALS CONTENT FEEDSTOCKS

Bruce R. Mitchell, Sarver, and Harold E. Swift, Gibsonia, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 386,719, Aug. 8, 1973, abandoned. This application Apr. 10, 1974, Ser. No. 459,534
Int. Cl.² C10G 11/04; B01J 29/12
U.S. Cl. 208—120 29 Claims



1. A process for the catalytic cracking of a high metals content charge stock having a total metals concentration as calculated in accordance with the relationship

$$10\,[Ni] + [V] + [Fe] \geqq 10$$

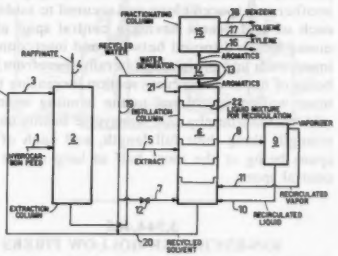
where [Ni], [V] and [Fe] are the concentrations of nickel, vanadium and iron, in parts per million by weight, which comprises contacting said charge stock in the absence of added hydrogen under catalytic cracking conditions with a catalyst comprising from 1 to 40 weight percent of a zeolite having cracking characteristics dispersed in a refractory metal oxide matrix, said matrix having a pore size distribution such that less than 20 volume percent of the pores have a pore diameter of less than 50 A and the average pore diameter is at least 90 A.

3,944,483

DISTILLATIVE RECOVERY OF AROMATICS WITH WATER ADDITION IN AZEOTROPIC PROPORTIONS

Fritz Schwall; Gerhard Preusser, both of Essen, and Martin Schulze, Neviges, all of Germany, assignors to Krupp-Koppers GmbH, Essen, Germany

Filed Dec. 20, 1973, Ser. No. 426,790
Claims priority, application Germany, Dec. 20, 1972, 2262303
Int. Cl.² C10G 21/28
U.S. Cl. 208—321 14 Claims



1. In a process for the recovery of aromatic hydrocarbons from mixtures which contain aromatic and non-aromatic hydrocarbons, comprising subjecting a mixture which includes an aromatic and a non-aromatic hydrocarbon to extractive treatment with a water-containing solvent so as to form an extract phase which contains at least part of said solvent and at least a portion of said aromatic hydrocarbon; admitting at least a portion of said extract phase into a distillation zone having an upper and a lower end portion; distilling said extract phase in said zone for recovery of said portion of said aromatic hydrocarbon; and introducing into said lower end portion of said zone a quantity of water, the improvement consisting essentially of, providing said quantity of water in an amount which equals between about 60 and 100 percent by weight of the amount of water required to form an azeotrope with said portion of said aromatic hydrocarbon, said quantity of water being additional to the water contained in said extract phase.

3,944,484

STRUCTURAL SUPPORTS FOR HEAVY DUTY RIDDLE ASSEMBLY

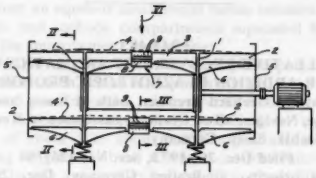
Waclaw Jachna, Tychy, Poland, assignor to Centralny Osrodek Projektowo-Technologiczny Przemyslu Maszyn Gorniczych "ORTEM", Katowice, Poland

Continuation-in-part of Ser. No. 402,578, Oct. 1, 1973, abandoned, which is a continuation of Ser. No. 110,123, Jan. 27, 1971, abandoned. This application Feb. 22, 1974, Ser. No. 444,804

Claims priority, application Poland, Feb. 6, 1970, 138661

Int. Cl. B07b *1/46*

U.S. Cl. 209—409 5 Claims



1. A riddle assembly comprising:

a pair of longitudinally extending outer vertical plates;

a pair of transversely spaced longitudinally extending inner walls disposed between said plates and parallel to a longitudinal plane spaced midway between said inner walls;

a sieve deck overlying said inner walls and having longitudinal edges projecting laterally beyond said walls, said screen being bisected by said plane and flanked by said outer plates;

a plurality of transverse beams extending parallel to one another and spaced along and secured to said inner walls, each of said beams having a central span of predetermined length disposed between and interconnecting said inner walls and projecting laterally therefrom, said spans being of nonuniform cross section increasing toward said inner walls proportional to the bending moments along said beams whereby said transverse beams have uniform strength along their full length, and each of said outer spans being at the most half as long as the respective central spans.

3,944,485

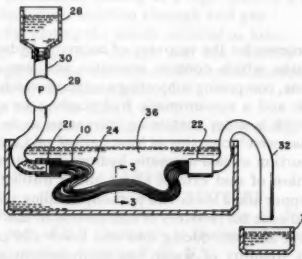
ION-EXCHANGE HOLLOW FIBERS

Alan Rembaum; Shiao-Ping S. Yen, both of Altadena, Calif., and Elias Klein, New Orleans, La., assignors to California Institute of Technology, Pasadena, Calif.

Filed May 23, 1973, Ser. No. 363,130

Int. Cl.[2] B01D *15/00;* C08J *5/24;* B29D *27/00*

U.S. Cl. 210—24 15 Claims



1. A method of removing ions from solution comprising the steps of:

passing a first solution of a salt through the central channel of a hollow, thin-wall microporous fiber of a synthetic, organic, thermoplastic resin having pores which join to form a path across the wall of the fiber and containing solid, insoluble, ion-exchange resin particles formed in situ in said pores from ion-exchange resin reactants of a molecular weight capable of impregnating the pores, having a diameter smaller than the pore diameter and having an even distribution of fixed charge embedded and constrained within said pores without blocking said pores or said path; and passing the ion of unlike charge to the fixed charge of the embedded resin through the wall of the fiber.

3,944,486

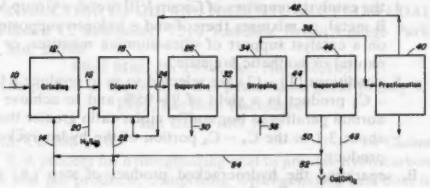
PROCESS FOR TREATING SULFIDE-CONTAINING MATERIALS

Joon Taek Kwon, Freehold Township, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Jan. 15, 1973, Ser. No. 323,407

Int. Cl.[2] C01F *11/10*

U.S. Cl. 210—59 5 Claims



1. A process for recovering sulfur and calcium values from a material containing calcium sulfide, comprising:

digesting said material containing calcium sulfide in an aqueous medium at a temperature of from 32°F to 215°F in the presence of an atmosphere of hydrogen sulfide to produce an aqueous solution of calcium hydroxyhydrosulfide having a mole ratio of sulfide ions to calcium ions of more than 1.5 and less than 2.0;

separating insoluble sulfide material from the aqueous solution of calcium hydroxyhydrosulfide; and

contacting said aqueous solution of calcium hydroxyhydrosulfide with an inert gaseous stripping medium to recover sulfur values as hydrogen sulfide and calcium values as calcium hydroxide.

3,944,487

CATALYTIC FILTERING-INCINERATING PROCESS AND DEVICE FOR WASTE WATER

Delmar B. Davis, and Wendell N. Christensen, both of Brigham City, Utah, assignors to Thiokol Corporation, Newtown, Pa.

Continuation of Ser. No. 440,101, Feb. 6, 1974, abandoned, which is a continuation-in-part of Ser. No. 304,165, Nov. 6, 1972, abandoned. This application Dec. 4, 1974, Ser. No. 529,653

Int. Cl.[2] B01J *9/04;* C02B *1/34*

U.S. Cl. 210—62 4 Claims

1. The method for destroying oxidizable pollutants of atomic to colloidal size in water, comprising the steps of:

adding hypochlorite ions to the water;

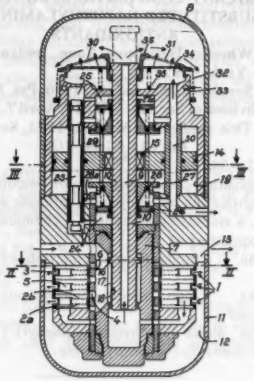
flowing the water through a filter bed of particulate, porous, refractory, substrate material containing catalytic material composed of oxides of at least one metal selected from the group consisting of nickel, iron, cobalt, iridium, and mixtures thereof, said oxides formed at temperatures from 550° to 900°F in the presence of a gas containing oxygen, and within the pores of said substrate, wherein said substrate is selected from aluminas having an average pore diameter within the range from 80 to 100 angstroms, and molecular sieves with channels having an average opening from 8 to 40 angstroms, whereby the metallic oxides catalyze decomposition of the hypochlorite ions to

produce atomic oxygen, which oxidizes at least some of the pollutants into harmless products;
draining the filtered water from the filter bed;
heating the filter bed to above 900°F; and
forcing oxygen-containing gas through the filter bed, whereby any remaining pollutants entrapped by the filter bed are incinerated, the filter bed is cleaned, and the metal-oxide catalysts are refurbished.

3,944,488
SELF-CLEANING FILTER WITH MOTOR INCORPORATED THEREWITH

Samuel Georges Moatti, 17, rue Gutemburg, Boulogne (Hauts-de-Seine), France

Continuation of Ser. No. 253,858, May 16, 1972, abandoned.
This application Mar. 18, 1974, Ser. No. 452,407
Claims priority, application France, May 19, 1971, 71.18275
Int. Cl.² B01D *29/38*
U.S. Cl. 210—108 9 Claims

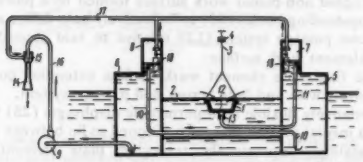


1. A self-cleaning filter which comprises:
a vessel;
an inlet conduit means for introducing into said vessel a fluid to be treated;
a plurality of filtering element means for separating impurities from the fluid being treated, said plurality of filtering element means being disposed parallel to each other within said vessel and forming a series of radially and axially separated filtering chamber each filtering element means having a central passage forming a central passageway within said plurality of filtering element means, each filtering element means having feed orifice means for fluid communication between said inlet conduit means and said filtering chambers;
a rotary obturator means positioned within said central passageway for successively closing feed orifice means to a series of filtering chambers to permit continuous removal of impurities from such series of filtering chambers when said filter is in an operational mode;
outlet conduit means for removing impurities from said series of filter chambers;
outlet conduit means for removing filter fluid from said filtering chambers;
a control rod disposed for reciprocal and continuous movement in said vessel to actuate said rotary obturator means;
a hydraulic motor means comprising a piston means disposed for reciprocal movement within a compartment of said vessel and integrally connected to said control rod, said piston means being alternately subjected to the pressure of the fluid being treated on opposite faces thereof;
a distributor slide means disposed within a distribution chamber including end sub-chambers of said vessel for alternating the flow of fluid to a face of said piston means;
conduit means for introducing fluid into said distribution chamber;
a piston drive means for activating said distributor slide means at a terminus of a stroke of said piston means; and
outlet conduit means for withdrawing filtered fluid from said vessel.

3,944,489
APPARATUS FOR PUMPING OIL-WATER MIXTURE FROM A COLLECTION VESSEL OF A FLOATING OIL COLLECTOR INTO SETTLING TANKS

Abram Yakovlevich Derzhavets, prospekt Gagarina, 4, kv. 5; Petr Grigorievich Kogan, ulitsa Perekopskoi divizii, 2, kv. 14, and Viktor Iosifovich Tabachnikov, ulitsa Varnenskaya 19, korpus 8, kv. 31, all of Odessa, U.S.S.R.

Filed June 1, 1973, Ser. No. 366,212
Int. Cl.² E02B *15/04*
U.S. Cl. 210—242 R 2 Claims

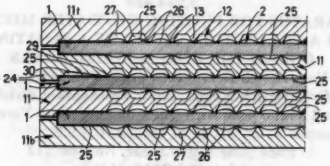


1. An apparatus for pumping oil-water mixture from a collection vessel of a floating oil collector into settling tanks, comprising: closed settling tanks, at least one oil receiving means for collecting oil-water mixture, arranged below the level of the liquid in said collection vessel; means providing for vertical displacement of said oil receiving means; a pump for pumping water from the lower part of one of said settling tanks outboard of said floating oil collector; an aspirating air-water jet ejector for maintaining substantially permanent vacuum in each said settling tank, said ejector having the air line thereof connected to the upper part of each said settling tank, said ejector having the jet nozzle thereof connected to the delivery side of said pump; a conduit connecting said oil receiving means with the upper part of one of said settling tank; a second conduit connecting the lower part of said one settling tank having the upper part thereof connected by said first-mentioned conduit with said oil-receiving means, to the upper part of another said settling tank from said lower part of which said pump is connected to pump water, the water column established in said first-mentioned conduit connecting said oil-receiving means with said upper part of said one settling tank being higher than the water column established in said second conduit.

3,944,490
DIALYSIS APPARATUS FOR PURIFYING FLUID SUBSTANCES

Paul-Johny Johansson, Norbergsgatan 6, 223 55 Lund, Sweden

Filed Feb. 19, 1974, Ser. No. 443,469
Claims priority, application Sweden, Dec. 10, 1973, 7316619
Int. Cl.² B01D *13/00*
U.S. Cl. 210—321 A **14 Claims**



1. A dialysis apparatus embodying interleaved plates and flexible semi-permeable diaphragms for purifying a fluid, preferably blood, which contains contaminants that are caused to diffuse out through the semi-permeable diaphragms into a purification fluid, to remove the contaminating substances, said apparatus comprising:

at least one first type plate element (1) with at least one planar work surface (2);

at least one second type plate element (11) with an interrupted non-planar work surface formed by a plurality of upstanding bosses (13) to collectively help define at least one passage system (12) relative to said second plate element work surface;

said first plate element work surface extending coextensively with and fully across said passage system;

a relatively flexible semi-permeable diaphragm (25) having a medial portion thereof positioned to lie between and to sealingly separate the respective plate element work surfaces (2, 13) from one another;

said diaphragm (25) being sandwiched and held against the planar work surface (2) of said first plate element (1) by the bosses (13) of said second plate element (11);

said diaphragm disposed so as to form and define first fluid-flow passages (26) between said diaphragm (25) and planar work surface (2), and to form second fluid-flow passages (27) between said diaphragm and said bossed work surfaces (13);

said first passages (26) adapted to convey one of the fluids, and said second passages (27) adapted to convey the other of said fluids; and

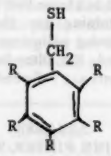
wherein the first plate element (1) is somewhat smaller peripherally than said second plate element (11), and the latter is provided with transversely extending peripheral edge flanges (24) defining a generally recessed area within said peripheral edge flanges (24) corresponding essentially to the area of said first plate element (1) for receiving a membrane-covered first plate element (1) therein, and for facilitating proper orienting and securing said first plate element (1) in relation to said second plate element (11).

3,944,491
LUBRICANTS

Bernard A. Baldwin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 20, 1975, Ser. No. 542,272
Int. Cl.² C10M *1/38, 3/32, 5/22, 7/36*
U.S. Cl. 252—45 **7 Claims**

1. An improved lubricating composition comprising a mineral lubricating oil having incorporated therein a small quantity sufficient to improve the anti-wear properties of the resulting lubricating composition of an alkylbenzyl mercaptan of the formula



wherein each R is hydrogen or an alkyl group, wherein at least one alkyl group is present in the molecule, and wherein there is a total of from 6 to about 25 carbon atoms in all of the combined R groups.

3,944,492
LUBRICANT COMPOSITIONS CONTAINING N-SUBSTITUTED NAPHTHYLAMINES AS ANTIOXIDANTS

Edward L. Wheeler, Woodbury, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 2,382, Jan. 12, 1970, Pat. No. 3,666,716, which is a division of Ser. No. 540,817, April 7, 1966, Pat. No. 3,505,225. This application May 22, 1972, Ser. No. 255,494
Int. Cl.² C10M *1/32*
U.S. Cl. 252—50 **4 Claims**

1. A composition comprising a major amount of a substrate which is a lubricating oil, containing intimate admixture, as an antioxidant, a stabilizing amount of a chemical selected from the group consisting of

N-(4-alpha, alpha-dimethylbenzylphenyl)-1-naphthylamine,

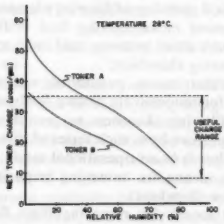
N-(4-alpha, alpha-dimethylbenzylphenyl)-2-naphthylamine, and

N-(4-alpha, alpha-dimethylbenzylphenyl)-1-(alpha, alpha-dimethylbenzyl)-2-naphthylamine.

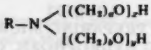
3,944,493
ELECTROGRAPHIC TONER AND DEVELOPER COMPOSITION

Thomas A. Jadwin, Rochester, and Robert C. Storey, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 16, 1974, Ser. No. 470,425
Int. Cl.² G03G *9/00*
U.S. Cl. 252—62.1 P **9 Claims**



1. An electrographic developer composition for developing electrostatic charge patterns comprising carrier particles having a particle size within the range of about 30 to about 1200 microns and, electrostatically attractable thereto, a dry particulate electroscopic toner composition comprising finely-divided particles comprising a resin and an alkoxylated amine having the formula:



wherein *a* and *b* represent integers of from 2 to about 4 and may be the same or different, *x* and *y* represent integers of from 1 to about 10 and may be the same or different, and R is an alkyl group containing from about 8 to about 30 carbon atoms; said amine comprising less than about 2 weight percent of said finely-divided particles.

3,944,494

STABILIZATION OF TRICHLORODIFLUORO BENZENES

Walter Mahler, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 365,273, May 30, 1973, abandoned. This application May 16, 1974, Ser. No. 470,638

Int. Cl.² F28F *19/00*; C09K *5/04*

U.S. Cl. 252—68 **7 Claims**

1. In a method of heat transfer wherein trichlorodifluorobenzenes are cycled through a thermal gradient including temperatures above about 200°C, the improvement which comprises contacting said trichlorodifluorobenzenes with a thermally stabilizing amount of a solid acid acceptor selected from the group consisting of alkali metal borates, alkali metal phosphates, alkaline earth metal carbonates, alkaline earth metal borates and alkaline earth metal phosphates.

3,944,495

METAL DIALKYLDITHIOPHOSPHATES

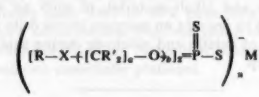
Morris A. Wiley; Raymond C. Schlicht, both of Fishkill, and James O. Waldbillig, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Feb. 19, 1974, Ser. No. 443,567

Int. Cl.² C09K *3/00*; C10M *1/48*

U.S. Cl. 252—75 **8 Claims**

1. An automatic transmission fluid comprising at least about 80 wt. % of a mineral lubricating oil and from about 0.01 to 5.0 wt. % of an alkyl dithiophosphate represented by the formula:



wherein:

R is a straight-chain aliphatic radial containing from about 4 to 30 carbon atoms;

X is carbonyloxy;

R′ is selected from a hyrogen, alkyl, and aryl radical;

M is selected from an alkali metal, an alkaline earth metal, and a transition metal;

a is an integer of from about 2 to about 12;

b is an integer of from about 1 to about 10; and

n is an integer corresponding to the valence of M.

3,944,496

COMPOSITION FOR CHEMICAL MILLING REFRACTORY METALS

Dolphus L. Coggins, 8719 Evans Lane, Berkeley, Mo. 63134, and Robert G. Werkema, 4736 Gatesbury Drive, St. Louis, Mo. 63129

Filed Apr. 30, 1973, Ser. No. 355,765

Int. Cl.² C09K *13/06, 13/08*; C23F *1/00*

U.S. Cl. 252—79.3 **3 Claims**

1. A composition for chemically milling and surface treating refractory metals and their alloys comprising per liter

A. about 210 to about 630 g. pure nitric acid equivalent,

B. phosphate ion producing material equivalent to about 98 to about 440 g. pure phosphoric acid,

C. an amount of fluoride producing material sufficient to provide the equivalent of about 61 to about 88 g. of pure hydrofluoric acid, and

D. a derivative of carbonic acid in an amount equivalent to at least about 15 grams of carbamide.

3,944,497

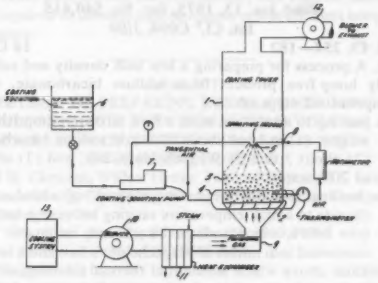
DETERGENT COMPOSITION CONTAINING COATED BLEACH PARTICLES

David S. Alterman, Parsippany, and Kil Whan Chun, Ridgefield Park, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 422,813, Dec. 7, 1973, Pat. No. 3,908,045. This application Apr. 14, 1975, Ser. No. 567,675

Int. Cl.² C11D *3/395, 9/30*

U.S. Cl. 252—96 **1 Claim**



1. A bleaching detergent composition comprising an anionic detergent admixed with encapsulated potassium dichloroisocyanurate in particulate form, said particles having thereon an inner and an outer coating, said inner coating comprising a fatty acid from 12 to 20 carbon atoms, or mixtures thereof, and said outer coating comprising a sodium salt of said acid, or mixtures thereof, said particles of potassium dichloroisocyanurate having said inner coating being completely encapsulated by said sodium salt, said detergent being in particulate form, and said detergent being free from amino nitrogen in its molecular structure.

3,944,498

GERMICIDAL DETERGENT CONTAINING A THIENYLIODONIUM SALT

Clarence L. Moyle, Clare, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 265,395, June 22, 1972, Pat. No. 3,763,187, which is a continuation-in-part of Ser. No. 154,182, June 17, 1971, abandoned, which is a continuation-n-part of Ser. No. 806,739, March 12, 1969, abandoned, which is a continuation-in-part of Ser. No. 677,772, Oct. 24, 1967, abandoned, Division of Ser. No. 323,977, Jan. 15, 1973, Pat. No. 3,885,036. This application Nov. 30, 1973, Ser. No. 420,429

Int. Cl.² C11D *3/48, 9/50*

U.S. Cl. 252—106 **2 Claims**

1. A germicidal detergent composition for controlling microbes of the group consisting of bacteria, fungi and yeasts comprising an anionic, nonionic or mixture of an anionic and a nonionic detergent and an antimicrobial amount of 4-chlorophenyl-2-thienyliodonium chloride, trifluoroacetate or trichloroacetate salt.

3,944,499

NON-AQUEOUS CLEANING COMPOSITION

Sabina Barbara Kopycinska Staniek, 304 Pitney Place, Convent Station, N.J. 07961

Filed July 11, 1973, Ser. No. 378,067
Int. Cl.[2] C09D 9/02
U.S. Cl. 252—167 2 Claims

1. A non-aqueous cleaning composition consisting essentially of about 1 to 5 parts by weight portland cement having a particle size passing through 120–200 mesh sieve; about 4 to 10 parts by weight of an alcohol selected from the group consisting of methanol, ethanol, propanol and isopropanol, and about 4 to 10 parts by weight of kerosene.

3,944,500

PRODUCTION OF LOW BULK DENSITY PRODUCT FROM SODIUM BICARBONATE

Alan B. Gancy, and Rustom P. Poncha, both of Syracuse, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Jan. 13, 1975, Ser. No. 540,615
Int. Cl.[2] C09K 3/00
U.S. Cl. 252—182 14 Claims

1. A process for preparing a low bulk density and substantially lump-free product from sodium bicarbonate, which comprises the steps of:

a. passing to a reaction zone a feed mixture comprising, by weight, (1) at least about 50% said sodium bicarbonate, (2) about 3 to 25% Wegscheider's Salt, and (3) about 5 to 20% water;

b. heating said mixture in the absence of added carbon dioxide to a first temperature ranging between a temperature below which sodium bicarbonate is unable to be converted into nuclei of Wegscheider's Salt and a temperature above which substantial thermal decomposition of sodium bicarbonate and substantial formation of sodium sesquicarbonate occurs, for a first time sufficient to form Wegscheider's Salt nuclei and to avoid substantial caking and bulk density increase of the mixture;

c. thereafter subjecting said heated mixture in the absence of added carbon dioxide at a second temperature ranging between a temperature at least about 10°C. higher than said first temperature and a temperature less than the decomposition temperature of Wegscheider's Salt for a second time sufficient to prepare product particles containing at least 10% by weight Wegscheider's Salt in needlelike form; and

d. recovering the product particles having a lower bulk density and a greater absorption property than said aqueous feed mixture.

3,944,501

SORBENT FOR REMOVAL OF HEAVY METALS

Darrell D. Whitehurst, Titusville; Stephen A. Butter, East Windsor, and Paul G. Rodewald, Rocky Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 365,358, May 30, 1973, Pat. No. 3,793,185, which is a continuation-in-part of Ser. No. 319,099, Dec. 27, 1972, abandoned. This application Oct. 16, 1973, Ser. No. 406,997
Int. Cl.[2] B01J 1/22; B01D 15/00; C09K 3/32
U.S. Cl. 252—182 6 Claims

1. A composition of matter comprising a substantially solid substrate comprising silicon having a minimum surface area of about 10 m^2/g to 800 m^2/g having pores with a minimum pore diameter of about 10 A to 500 A, having N, N′, N′-trimethyl-γ-propyl ethylene diamine bonded thereto and a Lewis acid metal halide, which metal is of the group consisting of iron, copper, silver, zinc, cadmium, mercury, aluminum, tin, lead, phosphorus, arsenic, antimony, bismuth, sulfur, selenium and telerium bonded to said amine.

3,944,502

PROCESS FOR PREPARING MICROCAPSULES CONTAINING HYDROPHOBIC OIL DROPS

Hiroharu Matsukawa; Keiso Saeki, and Takeo Shimada, all of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan

Continuation of Ser. No. 169,097, Aug. 4, 1971, Pat. No. 3,769,231. This application Oct. 15, 1973, Ser. No. 406,402
Claims priority, application Japan, Aug. 6, 1970, 45-68861
The portion of the term of this patent subsequent to Oct. 30, 1990, has been disclaimed.
Int. Cl.[2] B01J 13/02
U.S. Cl. 252—316 5 Claims

1. In a complex coacervation process for preparing microcapsules containing a hydrophobic oily liquid wherein gelatin is employed as one of the hydrophilic colloids forming the microcapsule walls in combination with a hydrophilic colloid, ionizable in water and having an electrically opposite charge to that of gelatin, said process comprising:

1. emulsifying said hydrophobic oily liquid in an aqueous solution of at least one hydrophilic colloid, ionizable in water to form a sol;
2. optionally, mixing said sol with an aqueous solution of a hydrophilic colloid to form a second sol;
3. forming coacervates comprising hydrophilic colloids, so as to encapsulate individual drops of said hydrophobic oily liquid in said sol;
4. cooling the resulting coacervates to gel the hydrophilic colloid thereof at a temperature lower than the gelling point of said gelatin;
5. subjecting the system to a conventional prehardening treatment in which an aldehyde and an alkali material are added to adjust the pH of the system to the alkaline side; and
6. hardening the gelled hydrophilic colloid to form the microcapsule walls;

the improvement which comprises:

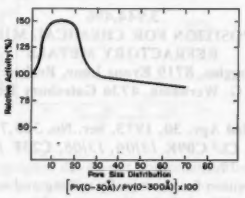
adding to the system gelatin having an isoelectric point lower than that of the gelatin employed as the hydrophilic colloid wall-forming material at a temperature lower than the gelling point of the gelatin employed as the hydrophilic colloid wall-forming material, but prior to the simultaneous presence in the system of said aldehyde and alkali material, in such an amount as sufficient to prevent an increase in viscosity due to the reaction of gelatin and aldehyde during said pre-hardening step.

3,944,503

CATALYST FOR CONVERSION OF HEAVY HYDROCARBON OILS

Munehisa Suto, Tokyo; Takuji Itoh, Saitama; Nobuaki Tagaya, Saitama, and Takashi Obayashi, Saitama, all of Japan, assignors to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 317,714, Dec. 22, 1972, Pat. No. 3,843,509. This application June 10, 1974, Ser. No. 478,041
Int. Cl.[2] B01J 29/06
U.S. Cl. 252—455 R 7 Claims



1. A catalyst comprising a catalytic metal or compound thereof on a porous silica-alumina carrier having a silica con-

tent in the range of between 0 and about 30% by weight and further characterized in that:

a. the volume of the pores in said catalyst having a radius in the range of from about 0 to about 300 A is greater than about 0.30 milliliters per gram;

b. the volume of the pores in said catalyst having a radius in the range of from about 0 to about 30 A is less than about 25% of the volume of the pores having a radius in the range of about 0 to about 300 A;

c. a volume of the pores having a radius in the range of from about 75 to about 300 A is less than about 40% of the volume of the pores having a radius in the range of from about 0 to about 300 A; and

d. the volume of the pores having a radius in the range of from about 75 to about 75,000 A is smaller than about 0.25 milliliters per gram.

3,944,504

CATALYST FOR THE DIMINUTION OF AUTOMOBILE EXHAUST GASES

James A. Ford, St. Louis, Mo., and Sheldon H. Butt, Godfrey, Ill., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 454,388, March 25, 1974, abandoned. This application Jan. 20, 1975, Ser. No. 542,184

Int. Cl.² B01J *21/04, 23/40, 23/74*

U.S. Cl. 252—455 R 12 Claims

1. A process for producing a catalyst for the removal of carbon monoxide and hydrocarbons from automobile exhaust gases comprising the steps of:

A. providing a substrate of a nickel base single-phase alloy comprising in solid solution 2 to 6% by weight aluminum and balance of 50 to 98% essentially of nickel, said alloy being capable of forming an adherent oxide layer mainly of aluminum oxide;

B. oxidizing the substrate alloy to produce the adherent alumina-rich layer at a temperature of from 350° to 1,000°F for a time of from 1 minute to 20 hours, said layer having a thickness of from 100 to 10,000 A; and

C. applying a layer of metal to the surface of the oxide layer, said layer having a thickness from 100 to 5,000 A and containing from .001 to 40% palladium, from 0.001 to 20% of a metal chosen from the group consisting of iridium, rhenium, osmium, ruthenium, and mixtures thereof, and balance essentially platinum.

3,944,505

CATALYTIC STRUCTURE

Roger Claude LaCroix, Suresnes, France, assignor to Comptoir Lyon-Alemond-Louyot, Paris, France

Filed July 22, 1974, Ser. No. 490,247

Claims priority, application France, Aug. 6, 1973, 73.28721

The portion of the term of this patent subsequent to Sept. 23, 1992, has been disclaimed.

Int. Cl.² B01J *21/04, 23/42*

U.S. Cl. 252—466 B 4 Claims

1. A catalytic structure comprising:

a stack of expanded metal sheets arranged in generally parallel relation and spaced apart a distance of about 0.5 to 2.5 mm, the transparency of each sheet being from 20 to 80% and the thickness of the sheets before expansion being from 0.05 to 0.25 mm;

means holding said sheets in said spaced relation in the form of a rigid block; and

each sheet having thereon a layer of at least one metal aluminide, wherein the metal of said metal aluminide is selected from the group consisting of nickel and cobalt, said metal aluminide layer being covered with a layer of alpha alumina supporting a catalytic surface layer of platinum.

3,944,506

ABRADANT SKIN CLEANSER CONTAINING A BORATE SALT

Jack Hramchenko, Menlo Park, and Murray J. Sibley, Berkeley, both of Calif., assignors to Barnes-Hind Pharmaceuticals, Inc., Sunnyvale, Calif.

Filed Aug. 17, 1973, Ser. No. 389,297

Int. Cl.² A61K *7/50;* C11D *1/83, 3/04, 3/14*

U.S. Cl. 252—526 12 Claims

1. An abradant skin cleansing cream consisting essentially of: from 20 to 80 weight percent of a slightly water soluble, non-toxic physiologically acceptable inorganic salt of a size in the range of about 20 to 200 mesh having a hardness greater than 1 Moh, said inorganic salt being a sodium or potassium tetraborate or a sodium or potassium pentaborate;

and from 80 to 20 weight percent respectively of a cream composition comprising from about 15 to 70 weight percent of a sodium salt of an anionic foaming agent based on a sulfuric acid anion; and

an amount of water from 5 to 65 weight percent of said cream composition and substantially less than the amount required to dissolve said inorganic salt at ambient temperature.

3,944,507

METHOD OF PREPARING RESINS CONTAINING SULFONIC ACID FUNCTIONALITY INVOLVING OXIDATION OF THIOURONIUM SALTS WITH HYDROGEN PEROXIDE

David H. Clemens, Willow Grove, Pa., and Raymond J. Lange, Wheelersburg, Ohio, assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 15, 1975, Ser. No. 540,773

Int. Cl.² C08F *8/06*

U.S. Cl. 260—2.1 R 6 Claims

1. A method of preparing a polymeric resin having sulfonic acid functionality which comprises a first step of reacting a halomethylated polymer matrix with a thiourea to form an isothiouronium salt and a second step of oxidizing the salt to form resin having sulfonic acid functionality.

3,944,508

THERMOPLASTIC MIXTURES SUITABLE FOR FOAMING IN THE EXTRUSION OR INJECTION MOLDING PROCESS

Hans-Jochen Barth, Emmerting; Herbert Reinecke, Burghausen; Georg Hollenbach, Burghausen, and Eduard Kurz, Burghausen, all of Germany, assignors to Wacker Chemie GmbH, Munich, Germany

Continuation of Ser. No. 283,253, Aug. 23, 1972, abandoned. This application May 21, 1974, Ser. No. 471,870

Claims priority, application Germany, Aug. 30, 1971, 2143377

Int. Cl.² C08J *9/10;* C08L *27/06*

U.S. Cl. 260—2.5 R 5 Claims

1. Thermoplastic mixtures suitable for foaming in the extrusion or injection molding process consisting of polymerizate mixtures of (A) from 50 to 95% by weight of a vinyl chloride polymerizate prepared by free-radical polymerization selected from the group consisting of (1) bulk polymerization and (2) emulsion and suspension polymerizations with continuous agitation, of vinyl chloride containing up to 20% by weight of ethylenically-unsaturated monomers copolymerizable with vinyl chloride and (B) from 5 to 50% by weight of a vinyl chloride polymerizate prepared by polymerization without further agitation of a stable, aqueous monomeric dispersion of vinyl chloride containing up to 20% by weight of ethylenically-unsaturated monomers copolymerizable with vinyl chloride prehomogenized in the presence of emulsifiers and oil-soluble catalysts, and from 0.1 to 5% by weight of said thermoplastic mixtures of azodicarbonamide as a foaming agent, said thermoplastic mixtures also having from 0 to 20% by weight of polymeric diluents, from 0 to 2% by weight of lubricants, 0 to

3% by weight of stabilizers, 0 to 0.2% by weight of activators and cell-size regulators, 0 to 5% by weight of plasticizers and from 0 to 0.5% by weight of dyestuffs.

3,944,509

KETO DIOXOLANES

William R. Adams, Oakland, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Filed June 11, 1973, Ser. No. 368,677
Int. Cl.² C07D 317/26
U.S. Cl. 260—340.9 4 Claims

1. 2-Trichloromethyl-4-benzoyl-4-phenyl-1,3-dioxolane.

3,944,510

ABS-FORMALDEHYDE NOVOLAK

Lewis H. Bowers, Scotia; Raymond E. Jankowski, Schenectady, and John L. Sullivan, Ballston Lake, all of N.Y., assignors to Schenectady Chemicals, Inc., Schenectady, N.Y.

Filed July 26, 1974, Ser. No. 492,967
Int. Cl.² C08L 9/02, 9/06, 61/10
U.S. Cl. 260—19 UA 13 Claims

1. In a phenol-formaldehyde novolak coated foundry sand composition suitable for use in forming a foundry core the improvement comprising including with the novolak 1 to 20% based on the phenol in the novolak of an acrylonitrile -butadiene-styrene terpolymer resin to form a foundry core of lower peelback then said composition without said terpolymer, said novolak having been formed from phenol and formaldehyde in the presence of an acid catalyst said terpolymer resin having been added prior to the completion of the formation of the novolak, said novolak and terpolymer being present together in an amount of 2 to 5% of the sand, said coated sand being suitable to form a foundry core of low peelback.

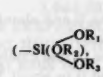
3,944,511

CHEMICALLY MODIFIED POLYMERS

Lynn J. Taylor, Haslett, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 23, 1971, Ser. No. 174,196
Int. Cl.² C08L 91/00
U.S. Cl. 260—23 H 33 Claims

1. A process for preparing chemically modified olefin homopolymers or olefin copolymers which consists of reacting about 60 to about 98% by weight of an olefin homopolymer or olefin copolymer with about 1 to about 30% by weight of a co-reactant, said co-reactant being a non-polymeric organic compound having the generalized structure R–X, where R is a saturated linear, branched or cyclic aliphatic hydrocarbon residue containing at least six carbon atoms, and X is at least one highly polar functional group selected from the group consisting of hydroxyl (—OH); carboxyl (—COOH); amide ($-CONH_2$); disubstituted amide ($-CONR_1R_2$), where R_1 and R_2 are the same or different lower alkyls containing one to four carbons; amino ($-NH_2$); disubstituted amino ($-NR_1R_2$), where R_1 and R_2 are the same or different lower alkyls containing one to four carbons; trialkoxysilyl



where R_1, R_2 and R_3 are lower alkyls containing one to four carbons, dihydrogen phosphate ($-OPO_3H_2$); carboxylate ($-COO^-$); and ammonium ($-NR_1R_2R_3$), where R_1, R_2 and R_3 are hydrogens or lower alkyls containing one to six carbons, said reaction being conducted in the presence of about 1% to about 20% by weight of a source capable of generating free radicals and in the presence of a stimulus selected from heat, light, oxygen, organic compound free-radical initiating reagents, and combinations thereof to cause said generation of free radicals.

3,944,512

PROCESS FOR THE MANUFACTURE OF HEAT-CURABLE SYNTHETIC RESINS WHICH CAN BE DILUTED WITH WATER AND ARE SUITABLE FOR THE ELECTROPHORETIC COATING PROCESS

Bernhard Broecker, Hamburg; Richard Schardt, Oststeinbek, and Gerhard Werner, Glashutten, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Mar. 11, 1974, Ser. No. 449,655
Claims priority, application Switzerland, Mar. 13, 1973, 3620/73
Int. Cl.² C08F 8/46, 279/02
U.S. Cl. 260—23.7 R 19 Claims

1. The process for the manufacture of heat-curable synthetic resins, based on reaction products of maleic anhydride with mixtures of polybutadiene, unsaturated hydrocarbon resins and unsaturated fatty acid glyceride esters, which can be diluted with water and are suitable for the electrophoretic coating process, characterised in that a mixture consisting of

a. 20–60% by weight of a polybutadiene having a number average molecular weight of 750–2,000 and an iodine number between 300 and 450,

b. 10–60% by weight of a polyisoprene resin having a viscosity between 30 and 800 cP (measured in 70% strength solution in toluene at 20°C) and an iodine number of between 160 and 400, and

c. 5–40% by weight of a fatty acid glyceride ester, wherein the fatty acid radical contains 16–18 C atoms and the fatty acid glyceride ester has an iodine number between 140 and 220,

is pre-polymerised by heating to 200°–270°C until the reaction mixture of components (*a*), (*b*) and (*c*), which has an initial viscosity of about 100 to 300 sec (measured according to DIN 53,211), displays viscosities between 500 and 2,000 sec (measured according to DIN 53,211), the resulting mixture is then reacted with

d. 10–20% by weight of maleic anhydride at 180°–190°C until no further free maleic anhydride is present, and the sum of the percents by weight of components (*a*), (*b*), c), and (*d*) being 100 percent by weight,

e. in the resulting adduct the anhydride groups present are opened by hydrolysis with water or alcoholysis with the amount of monohydric alcohols with 1–4 C atoms required to form the half-ester.

3,944,513

PURIFICATION OF POLYMER DISPERSIONS WITH ADSORBENT CARBON PARTICLES

Harold L. Greenwald, Jenkintown, and Benjamin B. Kine, Elkins Park, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 820,305, April 29, 1969, abandoned. This application Apr. 3, 1974, Ser. No. 457,326
Int. Cl.² C08L 33/02, 33/08, 33/10
U.S. Cl. 260—29.6 PT 10 Claims

1. A method of purifying a solid particulate addition polymer prepared from monomers having at least one ethyleni-

cally unsaturated structure selected from the group of structures consisting of $CH_2=C<$, $CH_2=CH-$, and $-CH=CH-$ in the form of an aqueous dispersion prepared by emulsion polymerization, the dispersion being contaminated with low molecular weight impurities, comprising the steps of contacting said aqueous dispersion with adsorbent carbon, the temperature of the dispersion being above the Tg of the dispersed polymer, the adsorbent carbon being between about five-sixteenths of an inch and 400 mesh, U.S. Sieve Series, in size, and separating said aqueous dispersion and said carbon.

3,944,514

PROCESS FOR THE MANUFACTURE OF RESIN-COATED REFRACTORY PARTICLES, PREFERABLY SAND

Keizo Nishiyama, Handa; Yasushi Yoshida, Kawanishi; Mutsumi Yamazaki, Osaka; Kohshi Iwata, Nagoya, and Yoshiaki Tanaka, Takaishi, all of Japan, assignors to Kabushiki Kaisha Jidoshokki Seisakusho, Japan

Filed Mar. 18, 1974, Ser. No. 452,461

Claims priority, application Japan, Mar. 22, 1973, 48-32834; Oct. 3, 1973, 48-110532

Int. Cl.² C08L *61/10*

U.S. Cl. 260—38 **8 Claims**

1. A process for the preparation of a composition of refractory granules, comprising:
   1. reacting 1 mole of at least one member selected from the group consisting of phenol, cresol and xylenol and 1 – 3 moles of at least one member selected from the group consisting of formalin and paraformaldehyde, in the presence of a catalytic amount of at least one member selected from the group consisting of ammonia, a primary amine and a secondary amine at 50° – 70°C for performing an addition-condensation reaction;
   2. keeping the reaction mixture under reduced pressure at 70°C or lower, as measured by the temperature of the products for dehydration until the products become substantially transparent;
   3. further keeping the reaction mixture under reduced pressure for removal of aqueous condensate formed by self- condensation until the temperature of the reaction mixture reaches 90° – 120°C;
   4. quenching the reaction mixture directly upon arrival of the temperature of the reaction mixture at the last mentioned temperature range, thereby forming a resol type phenolic resin having a softening point higher than 80°C; and
   5. thereafter mixing 70 – 100wt. % of said resol type phenolic resin with 0 – 30wt. % of a novalac-type phenolic resin, together with refractory granules kept at a temperature of at least 80°C until the granules attain a freely flowing state.

3,944,515

MOLDING COMPOUNDS

Kevin M. Foley, Hebron; Frank Paul McCombs, Granville, and Reuben H. Bell, Cincinnati, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 18, 1974, Ser. No. 524,721

Int. Cl.² C08K *3/30*; **C08L** *61/10*

U.S. Cl. 260—38 **7 Claims**

1. A method for producing a phenolic molding which includes the steps of mixing phenol, formaldehyde and a hydraulic cement at least 10 percent of which is Portland cement in such proportions that the mole ratio of formaldehyde to phenol is at least 1:1 and the weight of the hydraulic cement is from one to nine times the sum of the weight of the water charged to the mix and three-fifths of the weight of the formaldehyde charged to the mix, forming the resulting composition to a predetermined shape and maintaining the composition in the predetermined shape until an insoluble, infusible article is formed by condensation.

3,944,516

ADHESIVE COMPOSITION

Frederick D. Petke, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 7, 1975, Ser. No. 565,906

Int. Cl.² C08K *3/26*; **C08L** *67/02*

U.S. Cl. 260—40 R **3 Claims**

1. A composition comprising, based on the weight of the composition, an admixture of
   A. from 95–60 weight percent of a polyetherester having an inherent viscosity in the range of 0.5 to 1.4, the polyetherester being comprised of
      1. a dicarboxylic acid component comprised of
         a. from 90–60 mole percent terephthalic acid,
         b. from 10–40 mole percent cis/trans hexahydroterephthalic acid,
      2. a diol component comprised of, based on the weight of the diol component
         a. 80–60 weight percent 1,4-butanediol,
         b. 20–40 weight percent poly(tetramethylene glycol) having an average molecular weight in the range of 600–2000, and
   B. from 5–40 weight percent polystyrene having an inherent viscosity in the range of 0.2 to 0.7.

3,944,517

NOVEL POLYETHERIMIDES PREPARED FROM TOLANE DIANHYDRIDE OR DICHLOROETHYLENE DIPHENYLENE DIANHYDRIDE

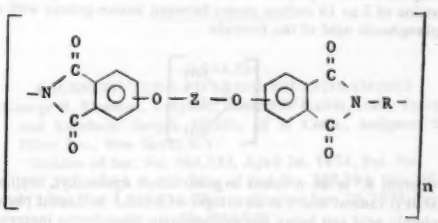
Clayton B. Quinn, and Frank J. Williams, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 14, 1975, Ser. No. 558,223

Int. Cl.² C08G *73/10*, *8/02*

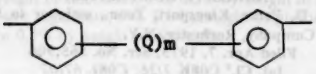
U.S. Cl. 260—47 CP **8 Claims**

1. A polyetherimide corresponding to the formula

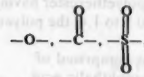


where n is a whole number greater than 1, R is a divalent organic radical selected from the class consisting of
   a. aromatic hydrocarbon radicals having from 6–20 carbon atoms and halogenated derivatives thereof,
   b. alkylene radicals, $C_{(n-4)}$ alkylene terminated polydiorganosiloxanes, cyclo-alkylene radicals having from 2–20 carbon atoms, and (c) divalent radicals included by the

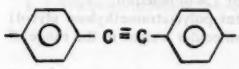
formula



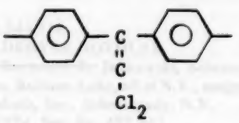
where Q is a member selected from the class consisting of



—S—, $-C_xH_{2x}-$ where x is a whole number from 1 to 5 inclusive, m is 0 or 1, and Z is a member selected from the groups



and



3,944,518

POLYAMIDES HAVING IMPROVED DYEABILITY AND THERMAL STABILITY

Harold George Burrows, and Stephen John Hepworth, both of Manchester, England, assignors to Imperial Chemical Industries, Ltd., London, England

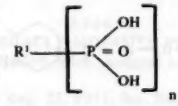
Filed June 15, 1966, Ser. No. 557,631

Claims priority, application United Kingdom, June 23, 1965, 26596/65

Int. Cl.[2] C08G *6/00*

U.S. Cl. 260—45.75 C 24 Claims

1. A polyamide comprising recurring carbonamide groups separated from each other by 2 to 18 carbon atoms and 0.1 to 10 molar percent based on the molecular weight of the recurring units of the polyamide chain, of a salt of an organic diamine of 2 to 18 carbon atoms between amino groups with a phosphonic acid of the formula:



wherein R^1 is an n-valent organic alkyl, cycloalkyl, aryl or aralkyl radical and n is an integer of from 1 to 3, said phosphonic acid salt being the predominate phosphorus material by molar percent.

3,944,519

CURABLE ORGANOPOLYSILOXANE COMPOSITIONS

Alan E. Mink, and Darrell D. Mitchell, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 13, 1975, Ser. No. 558,026

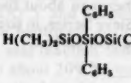
Int. Cl.[2] C08L *83/04*

U.S. Cl. 260—46.5 UA 5 Claims

1. A curable composition consisting essentially of a mixture of

a. an organopolysiloxane containing from 75 to 85 mol percent $C_6H_5SiO_{3/2}$ units and 15 to 25 mol percent $CH_2{=}CH(CH_3)_2SiO_{1/2}$ units, said organopolysiloxane having an average of at least 8 silicon atoms per molecule;

b. an organopolysiloxane of the formula



said organopolysiloxane being present in the mixture in an amount sufficient to provide about 0.9 to 1.1 mol of ≡SiH per mol of vinyl substituent present in siloxane (a);

c. a platinum catalyst present in an amount sufficient to catalyze the addition reaction of ≡ SiH with $CH_2{=}CHSi{\equiv}$

3,944,520

CYCLOLINEAR POLYORGANOSILOXANES AND METHOD FOR PREPARING SAME

Kuzma Andrianovich Andrianov, Vystavochny pereulok, 3, kv. 9, and Natalia Nikolaevna Makarova, ulitsa Bolshaya Cherkizovskaya, 8 korpus 1, kv. 24, both of Moscow, U.S.S.R.

Filed Apr. 18, 1974, Ser. No. 461,980

Int. Cl.[2] C08G *77/04*

U.S. Cl. 260—46.5 R 1 Claim

1. A cyclolinear polyorganosiloxane of the formula: $[XC_6H_4SiO_{1.5}]_n$ wherein X is selected from the group consisting of F, Cl and Br, and wherein n is $2 \times 10 - 2 \times 10^4$.

3,944,521

ANAEROBIC ADHESIVES CONSISTING OF POLYALKOXY DIACRYLATE ESTER OF BISPHENOL A MONOMER AND DIMETHYLAMINOETHYL METHACRYLATE MONOMER USING HYDROPEROXIDE AS CATALYST

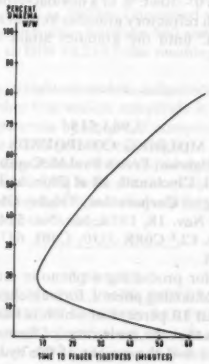
Geoffrey Bradley, Leeds; Keith Hargreaves, Huby, and Paul Wainwright, Leeds, all of England, assignors to Rocol Limited, Leeds, England

Filed Oct. 24, 1974, Ser. No. 517,645

Claims priority, application United Kingdom, Oct. 30, 1973, 50364/73

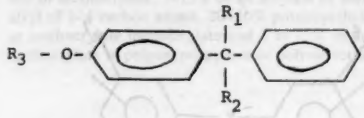
Int. Cl.[2] C09J *3/14*

U.S. Cl. 260—47 UA 9 Claims



1. Anaerobically curable compositions comprising a diacrylate ester monomer and hydroperoxide as a latent initiator of polymerization in an amount sufficient to initiate polymerization of said monomer, the monomer being of the general

formula:

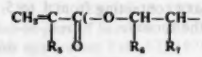


where:

the aromatic groups are benzene rings or other aromatic groups substituted or not;

R_1 and R_2 represent hydrogen, alkyl, aryl or hydroxyalkyl groups, or halogen; and

R_3 and R_4 represent



where *n* is an integer from 1 to 20 and particularly 1 to 5, and R_5, R_6 and R_7 represent hydrogen, alkyl or alkoxy groups, or halogen, said compositions further comprising 5–60% by weight of the composition of dimethylaminoethylmethacrylate.

3,944,522

AROMATIC POLYHYDRAZIDE FIBER OF HIGH MODULUS AND HIGH TENACITY

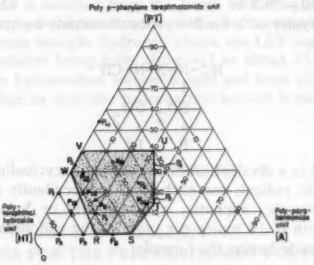
Shunroku Tohyama; Takuma Jinda; Shigemitsu Saito; Yoshizo Tsuda, and Satoshi Shinohara, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed June 16, 1972, Ser. No. 263,609

Claims priority, application Japan, July 2, 1971, 46-48083; Nov. 25, 1971, 46-94094

Int. Cl.² C08G *73/08*

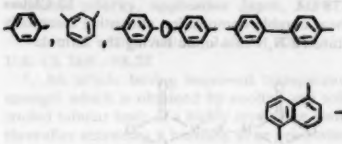
U.S. Cl. 260—47 CP **4 Claims**



1. High modulus and high tenacity aromatic polyhydrazide fiber composed of a copolymer, at least 85 mol % of the polymer chain of which consists essentially of repeating units from the group consisting of p-phenylene terephthalamide (PT), terethphal hydrazide (HT) and para-benzamide (A) in amounts within the range surrounded by a hexagon obtained by connecting with straight lines the points R, S, T, U, V and W in the triangular coordinates in the FIGURE, which is a ternary diagram of compositions consisting of (HT), (PT) and (A) and the points R, S, T, U, V and W therein represent mol % compositions as follows:

(HT)	75	60	42.5	30	60	70
(PT)	0	0	15	40	40	30
(A)	25	40	42.5	30	0	0

said copolymer also including not more than 15 mol % of units selected from the group consisting of $(Ar_1—Z_1)$ and $(Ar_1—Z_1—Ar_2—Z_2)$, wherein Ar_1 and Ar_2 are groups selected from the class consisting of



and a group obtained by replacing an H atom of these groups with an alkyl group or halogen, and Ar_1 and Ar_2 may be the same or different; Z_1 and Z_2 are groups selected from the class consisting of —CONH—, —NHCONH—and —CONH.NH-CO—, and Z_1 and Z_2 may be the same or different.

3,944,523

POLY(PHENOL/DIENE) RESIN AND RUBBER ADHESIVE COMPOSITIONS TACKIFIED THEREWITH

Ramsis Gobran, Roseville Village, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 23, 1973, Ser. No. 408,584

Int. Cl.² C09J *3/12*

U.S. Cl. 260—62 **10 Claims**

1. A method for making poly(phenol/diene) resin having alternately repeating diene and phenol units, a glass transition temperature in the range of 100°–220°C and a number average molecular weight in the range 600–5000, said resin thus capable of being homogeneously blended into an adhesive composition and thereafter resisting oozing from said composition and thereby providing permanent improved adhesive tack in said composition, which method comprises: adding in an inert atmosphere and in the presence of an effective amount of a Friedel-Crafts catalyst, 1 mole of non-conjugated diene with 1–1.75 mole of a phenolic compound having at least two ring carbon atoms susceptible of alkylation, at a temperature between about 20° and 130°C and heating the mixture at a temperature of about 130°C until the reaction is complete, and isolating the resulting poly(phenol/diene)resin.

3,944,524

4-SUBSTITUTED-1-PIPERIDINESULFONAMIDES

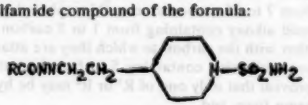
George R. Evanega, Ledyard; Donald E. Kuhla, Gales Ferry, and Reinhard Sarges, Mystic, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 464,332, April 26, 1974, Pat. No. 3,887,561, which is a division of Ser. No. 305,594, Nov. 10, 1972, Pat. No. 3,829,434. This application Jan. 28, 1975, Ser. No. 544,838

Int. Cl.² C07D *211/26*

U.S. Cl. 260—293.69 **3 Claims**

1. A sulfamide compound of the formula:



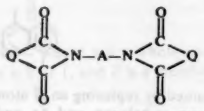
wherein R is a member selected from the group consisting of 2-methoxy-3-pyridyl 2-ethoxy-3-pyridyl and 4-chloro-2-pyridyl.

3,944,525
CROSSLINKED RESINS PREPARED FROM AN N,N'-BIS-IMIDE AND A SCHIFF BASE

Franklin P. Darmory, and Marianne DiBenedetto, both of Ardsley, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

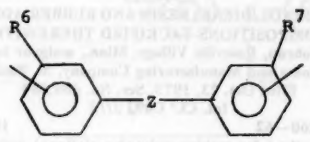
Filed Oct. 3, 1973, Ser. No. 403,236
Int. Cl.² C08G 69/29
U.S. Cl. 260—78 UA **12 Claims**

1. A stable heat curable composition consisting essentially of (a) an unsaturated N,N'-bis-imide having the formula



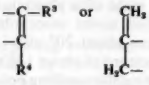
wherein

A is an alkylene group containing from 2 to 12 carbon atoms; cycloalkylene group containing from 4 to 6 carbon atoms, a xylylene group, an arylene group selected from phenylene, tolylene, biphenylene, naphthylene; a substituted arylene group of the formula



wherein Z is sulfur, carbonyl, —NH, N—(lower)alkyl, —O—, N-phenyl, sulfonyl, an alkylene group of from 1 to 3 carbon atoms, R^6 and R^7 are independent and each is hydrogen, chloro, or bromo, (lower)alkyl of from 1 to 5 carbon atoms, or (lower)alkoxy containing from 1 to 5 carbon atoms;

Q is a divalent radical containing olefinic unsaturation having the formula

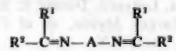


wherein

R^3 is hydrogen, methyl, bromo or chloro;

R^4 is hydrogen, methyl, bromo or chloro;

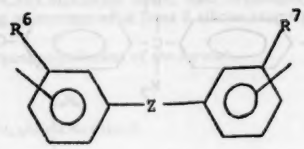
From about 0.5 to 0.166 mole equivalents per mole equivalent of (a) of a Schiff base having the formula



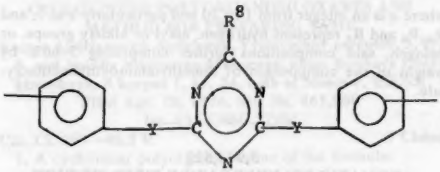
wherein

R^1 and R^2 independently is hydrogen, an alkyl group containing from 1 to 12 carbon atoms, an aryl group containing from 6 to 12 carbon atoms, an alkaryl group containing from 7 to 15 carbon atoms, an aralkyl group containing from 7 to 15 carbon atoms, chlorophenyl, alkoxyphenyl, said alkoxy containing from 1 to 5 carbon atoms, or together with the carbon to which they are attached form a monocyclic ring containing 5 to 6 carbon atoms, with the proviso that only one of R^1 or R^2 may be hydrogen at the same time; and

A is an alkylene group containing from 2 to 12 carbon atoms; cycloalkylene group containing from 4 to 6 carbon atoms, a xylylene group, an arylene group selected from phenylene, tolylene, biphenylene, naphthylene, a substituted arylene group of the formula



wherein Z is sulfur, carbonyl, —NH, —N(lower)alkyl, —O—, —N— phenyl, sulfonyl, an alkylene group of from 1 to 3 carbon atoms, R^6 and R^7 are independent and each is hydrogen, chloro, or bromo, (lower)alkyl of from 1 to 5 carbon atoms, (lower) alkoxy containing from 1 to 5 carbon atoms, or a group having the formula



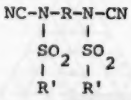
wherein Y is a covalent bond or —NH, and R^8 is phenyl piperidino, hydrogen, diphenylamino or di(lower)alkyl amino.

3,944,526
N-CYANOSULFONAMIDE RESINS AND INTERMEDIATES THEREFOR AND PRODUCTS THEREOF

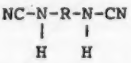
Raymond J. Kray, Berkeley Heights, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,487
Int. Cl.² C08G 75/30
U.S. Cl. 260—79.3 M **15 Claims**

7. A polymer of a bis-N-cyanosulfonamide compound of the formula



wherein R is a divalent aromatic, aliphatic, cycloaliphatic or heterocyclic radical; and each R^1 is independently a monovalent aromatic, aliphatic, cycloaliphatic or heterocyclic radical, with 0—10 moles per mole of the sulfonamide of a bis cyanamide having the formula:



wherein R is a divalent aromatic, aliphatic, cycloaliphatic or heterocyclic radical.

3,944,527
FLUOROALIPHATIC COPOLYMERS

Joseph Dana McCown, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 11, 1974, Ser. No. 487,606
Int. Cl.² C08F 218/00, 220/00, 28/00; C08G 75/30
U.S. Cl. 260—79.7 **7 Claims**

1. A hybrid tetracopolymer consisting essentially of the polymer of 40—70% fluoroaliphatic radical containing acry-

late or methacrylate, 5–15% of an acrylate or methacrylate of alkyl of 1–4 carbon atoms, 20–30% polyoxyethylene acrylate or methacrylate methacrylate and 5 to 15% of an acrylate or methacrylate of polyoxypropylene or polyoxytetramethylene.

3,944,528

SOLUTION DIENE ELASTOMERS BY ALKYL LITHIUM CATALYSIS

Frederick C. Loveless, Cheshire, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 421,458, Dec. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 289,042, Sept. 14, 1972, abandoned. This application Feb. 12, 1975, Ser. No. 549,416

Int. Cl.² C08F *236/10, 4/56*

U.S. Cl. 260—83.7 **11 Claims**

1. A process for preparing conjugated diene copolymers which comprises contacting a monomeric mixture of a conjugated diene hydrocarbon and from about 5 to about 50 parts by weight, based on 100 parts by weight of total monomers, of a vinyl-substituted aromatic hydrocarbon in which the vinyl group is attached to a nuclear carbon atom with a catalyst consisting essentially of (a) a complex having the formula

$$R'_y - Ar - OK \cdot HOR''$$

wherein R′ is an alkyl group containing a minimum of 8 carbon atoms per group and a maximum of 26 carbon atoms in one or more such groups, R″ is selected from the group consisting of hydrogen and aliphatic, cycloaliphatic and aromatic hydrocarbon radicals, Ar is an arylene radical containing one aromatic ring, and y is an integer from 1 to 3, inclusive, and from about 0.1 to about 20 millimoles, per 100 grams of said monomeric mixture, of (b) an organolithium compound having the formula R Li wherein R is a hydrocarbon radical selected from the group consisting of aliphatic, cycloaliphatic and aromatic radicals, said contacting occurring in the presence of a solvent which is liquid at the polymerization temperature and is selected from the group consisting of saturated aliphatic hydrocarbons and aromatic hydrocarbons which do not contain benzylic hydrogen atoms, the Li/K molar ratio of the cocatalyst being from about 4/1 to about 25/1 when an aliphatic hydrocarbon solvent is used and from about 20/1 to 90/1 when an aromatic hydrocarbon solvent is used.

3,944,529

PROCESS FOR THE PREPARATION OF POLYBUTENE-1

Henricus M. J. C. Creemers, Geleen, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed May 8, 1973, Ser. No. 358,415

Claims priority, application Netherlands, May 10, 1972, 7206290

Int. Cl.² C08F *210/00, 212/00, 110/00, 110/02*

U.S. Cl. 260—88.2 R **8 Claims**

1. In a process for suspension polymerizing butene-1 with 0 to about 20 mole % of at least one other α-alkene of up to 10 carbon atoms in the presence of a catalytic amount of a Ziegler coordination catalyst based upon at least one transition metal compound of a metal of groups IV B, V B and VI B and at least one organo-metallic compound of a metal of groups I, II, or III in an inert solvent, the improvement comprising using isobutane as the inert polymerization solvent and conducting the polymerization at a pressure such that the isobutane is a liquid at a temperature of about 50°C to about 70°C to obtain the butene-1 polymer in a substantially unswollen state.

3,944,530

ARTICLE MADE OF PROPYLENE-ETHYLENE COPOLYMER

Yasunori Sugita, Tokyo, and Yasuhiko Itagaki, Yokohama, both of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Sept. 17, 1974, Ser. No. 506,761

Claims priority, application Japan, Sept. 27, 1973, 48-107593

Int. Cl.² C08F *210/00, 212/00;* **B29C** *17/06, 23/00*

U.S. Cl. 260—88.25 **3 Claims**

1. An article having improved transparency and impact strength which is obtained by cooling and solidifying an extruded tubular body of a highly crystalline olefin polymer and thereafter extending it biaxially at an orientation temperature below the melting point to attain an extension magnification ratio of at least 1.5 for each of longitudinal and lateral directions, wherein said polymer is a statistical random copolymer of propylene with ethylene having a melt index of 0.6 – 3.0 g/10 min. and an ethylene content of from 0.3% to 5.0% by weight and contains a crystalline nucleating agent selected from the group consisting of aluminum p-tert-butyl benzoate and sodium p-tert-butyl benzoate in an amount of from 0.03 to 0.20 part by weight per 100 parts by weight of said statistical random copolymer.

3,944,531

PHENYL DERIVATIVES

Madhukar Subraya Chodnekar, Basel; Albert Pfiffner; Norbert Rigassi, both of Arlesheim; Ulrich Schwieter, Reinach, and Milos Suchy, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

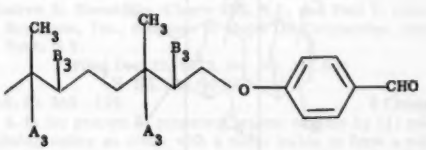
Filed Apr. 20, 1970, Ser. No. 30,295

Claims priority, application Switzerland, Apr. 30, 1969, 6597/69

Int. Cl.² C07C *47/52*

U.S. Cl. 260—600 R **6 Claims**

1. A compound of the formula:



wherein A_3 is hydrogen; and B_3 is hydrogen or taken together with A_3 forms a carbon to carbon bond.

3,944,532

NOVEL RESINS AND MANUFACTURING THE SAME

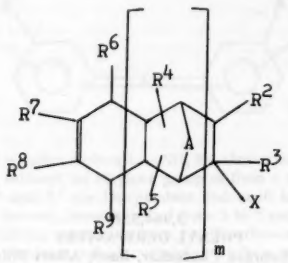
Shuhei Ishibe, Nara; Toshiharu Okumichi, Amagasaki, and Keizo Matsumoto, Osaka, all of Japan, assignors to Arkawa Rinsan Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 11, 1974, Ser. No. 449,731
Claims priority, application Japan, Mar. 12, 1973, 48-29265; Mar. 30, 1973, 48-36936; Mar. 30, 1973, 48-36937
Int. Cl.² C08F *120/04, 120/50, 120/12, 120/54*
U.S. Cl. 260—89.3 25 Claims

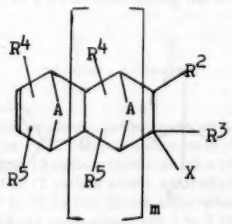
1. A process for manufacturing novel resin which consists essentially of reacting in the presence of Friedel-Crafts catalyst a Diels-Alder addition product with an aliphatic alcohol having the formula of

R^1OH

wherein R^1 is an aliphatic straight-chain or branched-chain saturated hydrocarbon group having 1 to 18 carbon atoms or alicyclic hydrocarbon group having 5 or 6 carbon atoms and having or not having a substituent of an alkyl group having 1 to 12 carbon atoms; said Diels-Alder addition product being at least one species selected from the group consisting of (*a*) compounds having the formula of



wherein each of R^2, R^3, R^4 and R^5 is a hydrogen atom or methyl group, each of R^6, R^7, R^8 and R^9 is a hydrogen atom or alkyl group having 1 to 4 carbon atoms, X is —COOH, —$COOR^a$, —CN or $CONH_2$, R^a being an alkyl group having 1 to 4 carbon atoms, A is $—CH_2—$ or $—CH_2CH_2—$, and *m* is an integer of 1 or 2, and (*b*) compounds having the formula of



wherein R^2, R^3, R^4, R^5, X, A and *m* are the same as defined above.

12. A process according to claim 2, in which said X is —COOH and the resulting resin is neutralized with a a base to produce a resin acid salt.

3,944,533

POLYALKENAMERS OF WIDE MOLECULAR-WEIGHT DISTRIBUTION

Manfred Beck, Odenthal; Rainer Fritz, Leverkusen, and Dieter Theisen, Remscheid, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Aug. 20, 1974, Ser. No. 498,980
Claims priority, application Germany, Aug. 25, 1973, 2343093; Sept. 27, 1973, 2348680
Int. Cl.² C08F *4/44, 36/00, 136/00, 236/00*
U.S. Cl. 260—93.1 8 Claims

1. A process for the ring-opening polymerisation of a cyclic olefin comprising:

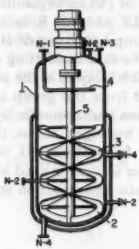
i. polymerising the cyclic olefin in the presence of a catalyst comprising:
   a. a metal halide of Groups VB or VIB of the Periodic System;
   b. an organometallic compound of a metal of Groups IIA, IIIA and IVA of the Periodic System; and
   c. optionally a co-catalyst at temperatures of from −70 to +60°C, and
ii. adding from 0.01 to 10% by weight, based on the monomer used, of a Defo hardness increasing compound containing a C=C-double bond in conjugation with a CO-double bond, either during or after polymerisation.

3,944,534

GASEOUS-PHASE POLYMERIZATION OF OLEFINS

Mutsuo Sennari; Yoichiro Izumi, and Taketoshi Fujita, all of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

Filed Aug. 4, 1971, Ser. No. 168,896
Claims priority, application Japan, Aug. 8, 1970, 45-69542
Int. Cl.² C08F *2/34, 10/00*
U.S. Cl. 260—93.7 13 Claims



1. In the production of an olefin polymer by contacting an α-olefin in a gaseous phase with a polymerization catalyst substantially in the absence of a liquid dispersing agent thereby to casue said α-olefin to undergo gaseous-phase polymerization, the improved process wherein said polymerization is carried out under the following conditions:

1. a solid phase comprising said catalyst and particulate olefin polymer is caused principally by mechanical agitation to undergo circulation in the up-and-down directions within a reaction chamber of substantially vertical-cylinder type, a reaction bed being formed by said circulating solid phase;
2. the ratio of the diameter to height of said reaction bed is of the order of from 1 : 0.5 to 1 : 3
3. substantially all the starting-material α-olefin is supplied in a liquid state into the reaction chamber from a point above the reaction bed and vaporized within the reaction chamber; and
4. heat of said polymerization reaction is removed principally by the latent heat of vaporization absorbed by said vaporization of the liquid α-olefin.

3,944,535
LOW TEMPERATURE SYNTHETIC RUBBER AND METHOD OF MAKING SAME

Robert J. Slocombe, Dayton, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

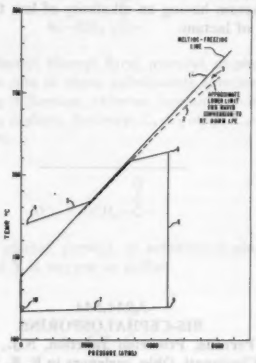
Filed Apr. 18, 1955, Ser. No. 502,189
Int. Cl.² C08F *4/66, 36/06*
U.S. Cl. 260—94.3 **2 Claims**

1. A method for polymerizing 1,3-butadiene which comprises contacting said 1,3-butadiene with a catalyst consisting essentially of (a) a compound corresponding to the formula R_3Al, wherein R is an alkyl radical having 2 to 4 carbon atoms and (b) titanium tetraiodide.

3,944,536
EXCEPTIONALLY RIGID AND TOUGH ULTRAHIGH MOLECULAR WEIGHT LINEAR POLYETHYLENE

John Madison Lupton, Wilmington, Del., and James Williams Regester, Aston, Pa., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed June 18, 1973, Ser. No. 370,715
Int. Cl.² C08F *14/00;* **B29J** *1/00;* **C08F** *10/02*
U.S. Cl. 260—94.9 R **6 Claims**



1. Linear polyethylene characterized by ultrahigh molecular weight, as determined from a melt index of essentially zero, indicating substantially no viscous flow above the crystalline melting point, an elastic modulus in the range of 340,000 to 500,000 psi., a tensile impact strength in the range of 140 to 600 ft.lb/in², a crystalline melting point in the range of 142°–148°C. at atmospheric pressure, as measured by differential thermal analysis, a density of 0.95 to 0.98 grams/cc at 25°C. and a unique crystalline from characterized by the absence of any detectable low-angle X-ray scattering peaks indicative of fold spacings in the range of 50–2000 A and by the presence, as seen in electron microscope photographs of cross sections, of a predominance of crystal spacings of about 10,000 A.

3,944,537
PREPARATION OF ALPHA-AMYLASE INHIBITOR

Robert M. Saunders, Albany, and George O. Kohler, El Cerrito, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 26, 1974, Ser. No. 527,401
Int. Cl.² A23J *1/12;* **C07G** *7/00*
U.S. Cl. 260—112 G **2 Claims**

1. A process for preparing alpha-amylase inhibitor, which comprises

a. applying an aqueous alkalizer to wheat material to adjust to a pH 8 to 9,
b. pressing a juice containing soluble proteins therefrom,
c. acidifying the juice to a pH of 5.0 to 6.0,
d. coagulating a solid protein concentrate within the juice by applying steam to the juice until its temperature is raised to 80° C.,
e. separating the so-coagulated solid protein concentrate from the juice,
f. adding acetone to the residual juice to precipitate the alpha-amylase inhibitor contained therein, and
g. separating the precipitated alpha-amylase inhibitor from the juice.

3,944,538
PROCESS AND APPARATUS FOR THE SYNTHESIS OF PEPTIDES NOT LINKED TO POLYMERS

Miklos Bodanszky, 18035 Fernway Road, Shaker Heights, Ohio 44122

Filed Oct. 2, 1973, Ser. No. 402,765
Int. Cl.² C07C *103/52;* **C07G** *7/00*
U.S. Cl. 260—112.5 R **20 Claims**

1. In a process for the synthesis of peptides by the reaction of a peptide or amino acid having a free amino group with a coupling peptide or amino acid having a protected amino group and an activated carboxyl group, wherein additional functional groups are protected, the improvement comprising conducting said synthesis in a single reactor vessel comprising the steps of charging to said vessel a non-polymerbound peptide or amino acid protected on its free amino group by a removable protecting group, adding sufficient acid to acidolytically remove the amino-protecting group from the peptide or amino acid and form a salt of said peptide or amino acid, adding to said vessel an organic solvent precipitant to form a solid precipitated peptide or amino acid salt and a liquid phase, separating the solid and removing the liquid phase from the vessel while retaining the solid peptide or amino acid in said vessel; dissolving or suspending said solid peptide or amino acid in a solvent suitable for an acylation reaction by adding the solvent to said vessel; acylating the free amino group of said peptide or amino acid by adding an organic base and an acylating peptide or amino acid having an N-protected amino group and an activated carboxyl group whereby said activated carboxyl group of the acylating peptide or amino acid reacts with the free amino group of the peptide or amino acid to couple said peptides or amino acids in said vessel; adding a non-solvent for the resulting coupled peptide to said vessel to precipitate the coupled peptide, and separating and removing the liquid phase from the vessel to provide the isolated solid peptide product, wherein all intermediates formed during said reactions are isolated in said reactor vessel.

3,944,539
PREPARATION OF SULFURIZED OLEFINS

Andrew G. Horodysky, Cherry Hill, N.J., and Paul T. Allen, Beaumont, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 22, 1972, Ser. No. 317,868
Int. Cl.² C07G *17/00*
U.S. Cl. 260—139 **8 Claims**

1. In the process of preparing organic sulfides by (1) sulfohalogenating an olefin with a sulfur halide to form a sulfohalogenated organic intermediate and thereafter (2) sulfurizing and dehalogenating said intermediate by subsequent reaction with an alkali metal sulfide, the reaction in (1) being run so as not to exceed 160°F and using an olefin to sulfur halide ratio of from about 1:1 to about 1:65:1 and the reaction in (2) being run at from about 150° to about 250°F using at least a stoichiometric amount of alkali metal sulfide, the improvement which comprises purging the reaction mixture in (1) with nitrogen prior to any substantial darkening of said intermediate.

3,944,540

PRECIPITATION OF ORGANIC DYES AND DYE INTERMEDIATES IN THE PRESENCE OF FINELY DIVIDED POLYTETRAFLUOROETHYLENE

Gerald D. Burt, Shaker Heights, and Anton Mudrak, Broadview Heights, both of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Filed Dec. 17, 1973, Ser. No. 425,064
Int. Cl.² C07C *107/06*; C09B *11/22*, *29/00*, *31/02*
U.S. Cl. 260—186 3 Claims

1. A process for crystallizing an organic essentially water-insoluble disperse dye or disperse dye intermediate comprising forming a water-insoluble dye or dye intermediate, in the presence of a water-wettable, finely divided, particulate polytetrafluoroethylene resin having an average primary particle size less than the average size of crystals to be deposited and crystallizing said dye or dye intermediate as a mass of crystals having an average diameter less than about 150 microns.

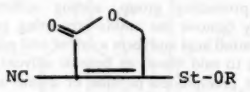
3,944,541

22-CYANO-24-NORCHOLANES

Nedumparambil A. Abraham, Dollard des Ormeaux, and Yvon Lefebvre, Pierrefonds, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed May 13, 1974, Ser. No. 469,269
Int. Cl.² C07J *19/00*
U.S. Cl. 260—210.5 3 Claims

1. A compound of formula



in which St—OR represents rings A, B, C and D of naturally-occuring 3β-oxygenated aglycones with their respective substituents attached thereto selected from the group consisting of digitoxigenin, periplogenin, digoxigenin and gitoxigenin, and R represents a glycosidic group naturally associated with the above aglycones and in which the cyanolactone ring is attached to the steroid moiety St at position 17β.

3,944,542

CONVERSION OF KETOXIMES INTO LACTAMS IN ORGANIC SULFOXIDE SOLVENTS

Abraham H. de Rooij, Geleen; Jan Elmendorp, Brunssum, and Willem J. Wassen, Geleen, all of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Continuation-in-part of Ser. No. 252,877, May 12, 1972, abandoned. This application Nov. 7, 1973, Ser. No. 413,435
Claims priority, application Netherlands, May 15, 1971, 7106705
Int. Cl.² C07D *201/04*
U.S. Cl. 260—239.3 10 Claims

1. In the continuous process for the catalytic conversion of an alicyclic ketoxime having from 3 to 13 carbon atoms into the corresponding lactam in the presence of a solvent and a strongly acid cation exchange resin catalyst in the H^+ form, the improvement comprising first dissolving said ketoxime in a dimethyl sulfoxide solvent and then contacting the thus-formed solution with said exchange resin catalyst at a temperature of from about 85° to about 130° C and at a space velocity of from between 0.1 and 10 moles of said ketoxime per liter of said exchange resin per hour, thereby producing the corresponding lactam in a continuous manner free from adherence to said exchange resin and wherein said dimethyl sulfoxide solvent both activates and regenerates said exchange resin catalyst.

3. The process as claimed im claim 1 wherein the ketoxime is cyclohexanone oxime or cyclododecanone oxime.

3,944,543

PROCESS FOR RECOVERY OF ε-CAPROLACTAM

Reijer Goettsch, Beek, and Abraham H. De Rooij, Geleen, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed June 11, 1974, Ser. No. 478,331
Claims priority, application Netherlands, June 12, 1973, 7308100
Int. Cl.² C07D *201/16*
U.S. Cl. 260—239.3 A 3 Claims

1. In a process for the purification and recovery of ε-caprolactam monomer of reduced alkalinity content including the steps of neutralizing a rearrangement mixture of the lactam and sulfuric acid to form an aqueous solution of lactam and ammonium hydrogen sulfate, extracting the lactam from the mixture with a water-immiscible organic solvent for the lactam, extracting the lactam/organic solvent solution with water to form an aqueous solution of lactam,

the improvement comprising extracting the thus-obtained aqueous lactam-rich solution with a water-immiscible organic solvent having a high distribution coefficient for the lactam with respect to the water of the aqueous solution forming a solution of the lactam in the organic solvent and thereafter evaporating the lactam-rich organic solvent and thereby recovering the purified lactam from the evaporation of the organic solvent, the thus-recovered lactam having an alkalinity of less than 0.05 meq. per kg of lactam.

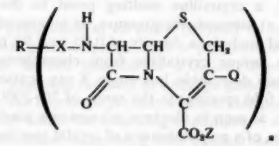
3,944,544

BIS-CEPHALOSPORINS

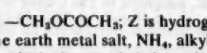
Donald J. Perrella, Princeton Junction, N.J., and Joseph E. Dolfini, Cincinnati, Ohio, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 291,442, Sept. 22, 1972, Pat. No. 3,825,536. This application May 30, 1974, Ser. No. 474,731
Int. Cl.² C07D *501/20*
U.S. Cl. 260—243 C 7 Claims

1. A compound of the formula:



wherein R is furyl or thienyl; X is



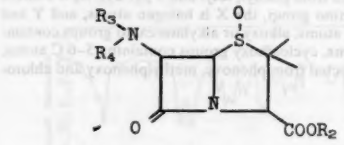
Q is $-CH_3$ or $-CH_2OCOCH_3$; Z is hydrogen, an alkali metal salt, an alkaline earth metal salt, NH_4, alkyl of 1 to 4 carbons, trichloroethyl, pivaloyloxymethyl, benzyl, p-nitrophenyl, trimethylsilyl, trimethylstannyl, methoxymethyl, triethylamine, procaine, dibenzylamine, N-benzyl-β-phenethylamine, N,N-dibenzylethylenediamine, or N-ethylpiperidine; and *n* is 2, 3 or 4.

3,944,545
PROCESS FOR PREPARING DESACETOXYCEPHALOSPORINS

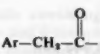
Ta-Sen Chou, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 252,078, May 10, 1972. This application Apr. 12, 1973, Ser. No. 349,876
Int. Cl.[2] C07D *501/10*
U.S. Cl. 260—243 C **11 Claims**

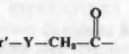
1. A process for preparing a desacetoxycephalosporin from a penicillin sulfoxide of the formula



in which R_3 is hydrogen and R_4 is hydrogen; C_1–C_8 alkanoyl; azidoacetyl; cyanoacetyl; haloacetyl;

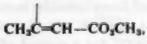


in which Ar is phenyl, thienyl, furyl, pyrrolyl, or phenyl substituted with from one to three substituents selected from the group consisting of fluorine, chlorine, bromine, iodine, trifluoromethyl, C_1–C_3 acyloxy, hydroxy, C_1–C_3 alkyl, C_1–C_3 alkoxy, cyano, and nitro;

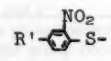


in which Ar' is phenyl, pyridyl, or substituted phenyl as defined above, and Y is oxygen or sulfur;

in which Ar is as defined above, and B is C_1–C_3 acyloxy, hydroxyl, carboxyl, esterified carboxyl, —CN, $—N_3$, $—NH_2$, or —NHR in which R is benzyloxycarbonyl, C_1–C_4 alkoxycarbonyl, cycloalkoxycarbonyl, triphenylmethyl,



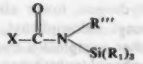
or 2,2,2-trichloroethoxycarbonyl; (3-sydnone)-C_2–C_3 alkanoyl;



in which R' is hydrogen or methoxy; 2-(1H-tetrazol-1-yl)acetyl; or R_3 and R_4 taken together with the nitrogen atom to which they are bonded are phthalimido, a cyclic imide moiety of a C_2–C_{12} dicarboxylic acid, 2,2-dimethyl-5-oxo-4-phenylimidazolidin-1-yl, or 2,2-dimethyl-3-nitroso-5-oxo-4-phenylimidazolidin-1-yl; and R_2 is hydrogen, C_1–C_6 alkyl, 2,2,2-trihaloethyl, 2-iodoethyl, benzyl, nitrobenzyl, tetrahydropyranyl, 9-fluorenyl, succinimidomethyl, phthalimidomethyl, methoxybenzyl, dimethoxybenzyl, cyanomethyl, nitrophenyl, dinitrophenyl, 2,4,6-trinitrophenyl, bis(p-methoxyphenyl)methyl, triphenylmethyl, benzhydryl, benzyloxymethyl, C_2–C_6 alkanoyloxymethyl, C_2–C_4 alkanoyl, phenacyl, or a radical of the formula

in which each R_1 independently is c_1–C_4 alkyl or phenyl; which comprises heating the penicillin sulfoxide in an inert, substantially anhydrous solvent to a temperature of from about 75°C. to about 150°C. in the presence of from about 1.1 to about 4 equivalents of a silylating agent of the formula

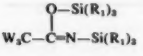
a.



in which each R_1 independently is C_1–C_4 alkyl, or phenyl, R''' is hydrogen, C_1–C_4 alkyl, or phenyl, and X is

in which J is hydrogen or $—Si(R_1)_3$, or X is $—CW_3$ in which each W independently is hydrogen, trifluoromethyl or C_1–C_3 alkyl;

b.



in which R_1 and W are as herein defined; and

c. $Z—Si(R_1)_3$

in which R_1 is as herein defined and Z is halogen, C_2–C_3 alkenyloxy, C_1–C_3 alkyl—SO_3—, $—O—Si(R_1)_3$, $—S—Si(R_1)_3$, or

in which R_5 is hydrogen or c_1–C_3 alkyl, and R_6 is C_1–C_4 alkyl or $—Si(R_1)_3$, or R_5 and R_6 taken together with the nitrogen atom to which they are bonded form a heterocyclic ring having 5 or 6 atoms, up to 3 of which, in addition to the already-defined nitrogen atom, independently are nitrogen, sulfur, or oxygen;

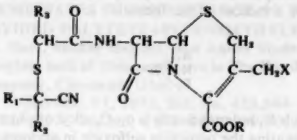
and simultaneously or subsequently treating the reaction mixture in an acidic medium selected from the group consisting of a mineral acid, a sulfonic acid, and a Lewis acid.

3,944,546
CYANOMETHYLTHIOACETYLCEPHALOSPORINS

Hermann Breuer, and Uwe Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 278,168, Aug. 4, 1972, Pat. No. 3,855,212. This application Oct. 10, 1974, Ser. No. 513,675
Int. Cl.[2] C07D *501/20*
U.S. Cl. 260—243 C **7 Claims**

1. A compound of the formula



wherein

R is hydrogen or the salt forming ion of the group consisting of aluminum, alkali metal, alkaline earth metal, lower alkylamine, phenyl-lower alkylamine, N,N'-dibenzylethylenediamine, procaine or lower alkylpiperidine;

R_1 and R_2 each is hydrogen, lower alkyl, lower alkenyl, phenyl, hydroxyphenyl, chlorophenyl, benzyl, phenethyl, or R_1 and R_2 together complete a cyclopentyl or cyclohexyl group; R_3 is phenyl, substituted phenyl or thienyl, said phenyl substituents being halogen, lower alkyl, amino or lower alkoxy; and

X is hydrogen or lower alkanoyloxy.

3,944,547

NEW IMINOISOINDOLINONE PIGMENTS

Ernst Model, Basel; Jost von der Crone, and Andre Pugin, both of Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

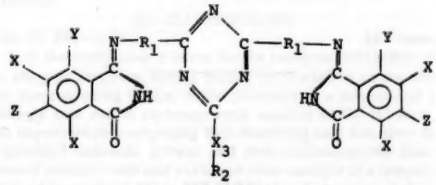
Filed Aug. 5, 1974, Ser. No. 494,942

Claims priority, application Switzerland, Aug. 16, 1973, 11805/73

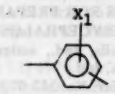
Int. Cl.² C07D 251/24, 251/42

U.S. Cl. 260—248 CS 6 Claims

1. A compound of the formula



wherein R_1 is an aromatic radical of the formula



wherein X_1 is hydrogen or methyl group, R_2 is hydrogen, an alkyl group containing 1–6 C atoms, a cycloalkyl group containing 5–6 C atoms or an isocyclic or heterocyclic aromatic radical selected from phenyl, tolyl and 3-pyridyl, X_2 is a direct bond or an imino group, the X is halogen atoms, and Y and Z are halogen atoms, alkoxy or alkylmercapto groups containing 1–6 C atoms, cycloalkoxy groups containing 5–6 C atoms, or aryloxy selected from phenoxy, methylphenoxy and chlorophenoxy.

3,944,548

PROCESS FOR RECOVERY OF CYANURIC ACID FROM CHLORINATOR MOTHER LIQUOR

James L. Manganaro, New York, N.Y.; Richard W. Cummins, Cranbury, and Raymond A. Olson, Westfield, both of N.J., assignors to FMC Corporation, New York, N.Y.

Filed Feb. 15, 1974, Ser. No. 443,113

Int. Cl.² C07D 251/28

U.S. Cl. 260—248 A 7 Claims

1. In a process which comprises

contacting a strong mineral acid with an aqueous effluent mother liquor resulting from chlorination of isocyanuric acid or salts thereof selected from the group alkali metal isocyanurates and alkaline earth metal isocyanurates, and complexes and mixtures thereof, in an aqueous medium maintained at a pH of from about 2 to about 8.5 and from which the resulting chlorinated isocyanurate product has been removed in crystalline form,

the improvement comprising adding concentrated strong mineral acid from the group hydrochloric and sulfuric in amounts sufficient to induce rapidly a pH of about 0.2 to about 1.2 in said mother liquor, thereby to convert soluble chlorinated isocyanuric acid values to cyanuric acid values, and to remove available chlorine from solution, and to form a slurry containing as a solid therein, cyanuric acid precipitated from solution in said mother liquor,

said operation being carried out at a temperature in the range of 5°C to 100°C for a period of at least 0.2 hour.

3,944,549

AMINO DERIVATIVES OF 1,4-BENZODIOXAN

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, Alfort, France

Filed Oct. 23, 1973, Ser. No. 408,947

Claims priority, application United Kingdom, Oct. 24, 1972, 49022/72

Int. Cl.² C07D 239/24

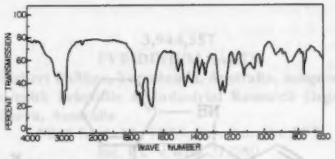
U.S. Cl. 260—256.4 N 8 Claims

1. The compound 1-[2-(1,4-benzodioxanyl)-methyl]-4-(2-hydroxyethyl)-piperazin hemifumarate.

3,944,550
VITAMIN E OROTATE AND A METHOD OF PRODUCING THE SAME

Kyotaro Hasunuma; Masahiro Kurokawa, and Takashi Abe, all of Odawara, Japan, assignors to Kanebo Ltd., Tokyo, Japan

Filed Sept. 27, 1973, Ser. No. 401,458
Claims priority, application Japan, Oct. 3, 1972, 47-99270
Int. Cl.² C07D 239/54
U.S. Cl. 260—260 2 Claims



1. Vitamin E orotate consisting of a tocopheryl moiety selected from α-, β-, γ- and δ-tocopheryl groups and an unsubstituted orotyl moiety combined with said tocopheryl moiety through an ester linkage.

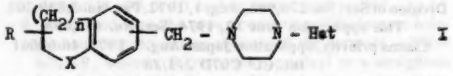
3,944,551
N-COUMARANYL AND CHROMANYL -METHYL-OR SULFUR ANALOGS THEREOF-N'- THIAZOLYL PIPERAZINES

Gilbert Regnier, Chatenay-Malabry; Roger Canevari, Villebon-sur-Yvette; Michel Laubie, Vaucresson, and Jean-Claude Poignantw, Bures-sur-Yvette, all of France, assignors to Science-Union et Cie, Neuilly-sur-Seine, France

Filed Mar. 25, 1974, Ser. No. 454,665
Claims priority, application United Kingdom, Apr. 2, 1973, 15692/73
Int. Cl.² C07D 295/12
U.S. Cl. 260—268 BC 9 Claims

1. A compound selected from the group consisting of:

A. disubstituted piperazines of the formula I:



I

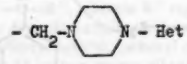
wherein:

n is selected from 1 and 2;

X is selected from the group consisting of oxygen and sulfur;

R is selected from the group consisting of hydrogen and alkyl having from 1 to 3 carbon atoms inclusive;

Het is selected from the group consisting of thiazolyl, methyl thiazolyl benzothiazolyl, and



is always bonded to the benzine ring, and,

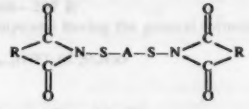
B. physiologically tolerable acid addition salts thereof.

3,944,552
N,N'-BIS IMIDOTHIO-DIAMINES

John P. Lawrence, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 266,008, June 26, 1972, Pat. No. 3,838,114. This application Mar. 7, 1974, Ser. No. 448,858
Int. Cl.² C07D 295/22
U.S. Cl. 260—268 BC 2 Claims

1. An imide of the formula:



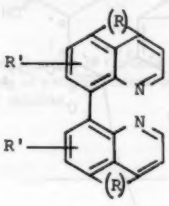
wherein R is selected from the group consisting of 4,5-cyclohexenylene, orthophenylene, ethylene and 1,3-propylene, and A is selected from the group consistng of divalent radicals derived from piperazine, 2,5-dimethylpiperazine, imidazolidine, hexahydropyrimidine, homopiperazine, N,N'-dimethylethylenediamine, N,N'-dimethyl-1,3-propylenediamine, N,N'-dimethyl-1,6-hexamethylenediamine, N,N-dimethyl-1,4-cyclohexylenediamine, and N,N'-dimethyl-p-phenylenediamine.

3,944,553
BIS QUINOLINE PERI ACIDS

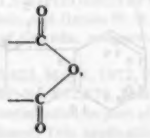
Michael K. O'Rell, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Feb. 13, 1974, Ser. No. 442,026
Int. Cl.² C07D 215/50, 491/06
U.S. Cl. 260—287 P 3 Claims

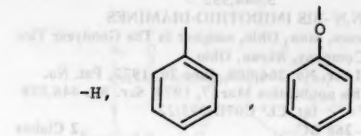
1. A compound having the structure:



where R is selected from the group consisting of



and (—COOH)₂ and R' is selected from the group consisting of —H,



and $-OCH_3$.

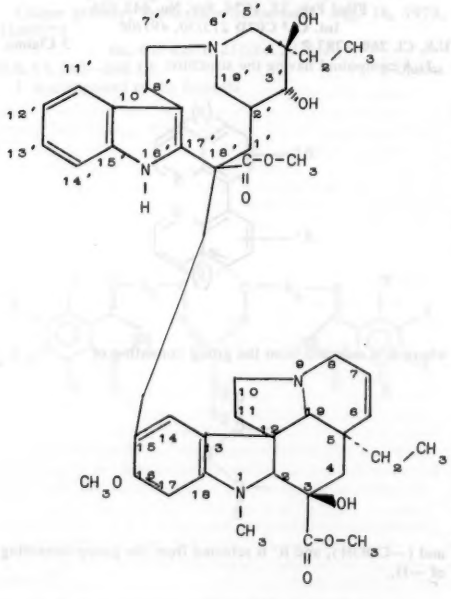
3,944,554

4-DESACETOXY-3-HYDROXYVINBLASTINE

Susan S. Tafur, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 9, 1975, Ser. No. 539,680
Int. Cl.² C07D 471/18
U.S. Cl. 260—287 B 2 Claims

1. 4-Desacetoxy-3′-hydroxyvinblastine having the formula



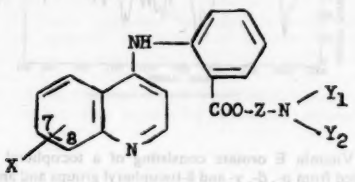
3,944,555

N-(QUINOLYN)-ANTHRANILATES

Anne Farthouat, Romainville, and Jean Meier, La Varenne Saint-Hilaire, both of France, assignors to Roussel Uclaf, Paris, France

Filed May 31, 1974, Ser. No. 474,885
Claims priority, application France, June 13, 1973, 73.21434
Int. Cl.² C07D 215/44
U.S. Cl. 260—287 AR 7 Claims

1. Substituted anthranilates selected from the group consisting of N-(7- or 8-substituted-quinolyl-4)-anthranilates of the formula



wherein X is trifluoromethyl in the 7 or 8 position, Z is a member selected from the group consisting of $-(CH_2)_n-$, where n is an integer from 2 to 6, and $-(CH_2)_m-O-(CH_2)_p-$, where m and p are each an integer from 2 to 3, and Y_1 and Y_2 are alkyl having from 1 to 6 carbon atoms, and their non-toxic, pharmaceutically acceptable acid addition salts.

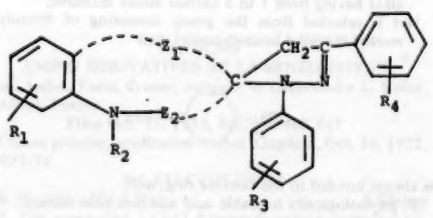
3,944,556

SPIRO-PYRAZOLINE DERIVATIVES AND METHOD FOR THE PRODUCTION THEREOF

Harumi Katsuyama, and Hisatake Ono, Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan

Division of Ser. No. 276,998, Aug. 1, 1972, Pat. No. 3,859,303.
This application June 12, 1974, Ser. No. 478,498
Claims priority, application Japan, Aug. 9, 1971, 46-60061
Int. Cl.² C07D 215/38
U.S. Cl. 260—288 CE 4 Claims

1. A spiro-pyrazoline compound having the formula (I)



wherein Z_1 represents $+CH=CH+_n$ in which n is 0 or 1; Z_2 is $+CH=CH+_{1-n}$; R_1 represents hydrogen, halogen, nitro, lower alkyl having from 1 to 3 carbon atoms, lower alkoxyl of from 1 to 3 carbon atoms or lower alkoxycarbonyl wherein the alkoxy group has from 1 to 3 carbon atoms; R_2 represents lower alkyl having from 1 to 3 carbon atoms; and R_3 and R_4 each represents hydrogen, halogen, or nitro.

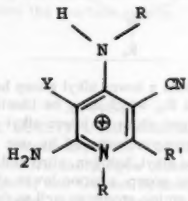
3,944,557

PYRIDINIUM SALTS

John Norbert Phillips, Yarralumla, Australia, assignor to Commonwealth Scientific & Industrial Research Organization, Canberra, Australia

Filed Sept. 11, 1973, Ser. No. 396,297
Int. Cl.² C07D 213/60
U.S. Cl. 260—294.9 8 Claims

1. Compound of the formula:

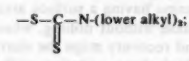


wherein:

Y is selected from the group consisting of hydrogen and halogen;

R is selected from the group consisting of straight or branched-chain alkyl or a chloro, bromo, nitro, lower alkoxy, pyridyl, carboxyl or furyl substituted alkyl of one to twelve carbon atoms; a cycloalkyl or a chloro, bromo, nitro, lower alkoxy, pyridyl, carboxyl or furyl substituted cycloalkyl of 5 to 10 carbon atoms; and aralkyl;

R′ is selected from the group consisting of hydrogen; halogen; sulphonate; azido; radicals of the formula —NH—SO_2—R_1 wherein R_1 represents p-toluyl or a straight-or branched-chain alkyl or a chloro, bromo, nitro, lower alkoxy, pyridyl, carboxyl or furyl substituted alkyl of one to twelve carbon atoms or radicals of the formula



radicals of the formula —CH—(CN)—R_2, wherein R_2 represents —COOH, —COO (lower alkyl) or —NH—CO—NH_2; and radicals of the formulae —NH—R″, —S—R″ or —O—R″, wherein R″ represents hydrogen, a straight- or branched-chain alkyl or a chloro, bromo, nitro, lower alkoxy, pyridyl, carboxyl or furyl substituted alkyl of up to 12 carbon atoms, alkenyl of at least three carbon atoms or alkynyl, a phenyl, benzyl or cyano, furfuryl, carboxymethyl, 2-bromoethyl, 2-picolyl, dimethylthiocarbamoyl or diethylthiocarbamoyl; and

A^- represents an anion.

3,944,558

FLUOROCARBON DERIVATIVES OF PYRIDINE

Leonard Eric Houghton, and John Hutchinson, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 18, 1972, Ser. No. 316,088
Claims priority, application United Kingdom, Jan. 13, 1972, 1597/72
Int. Cl.² C07D 213/26
U.S. Cl. 260—297 R 12 Claims

1. A compound having the general formula

$$[C_nF_{2n-1}(HF)_x](C_5H_4N)O$$

wherein

n is an integer from 3 to 20

x is 0 or 1

the group (C_5H_4N) is a pyridine nucleus and

O is an ether linkage oxygen atom covalently attached to the three position carbon atom of the pyridine nucleus and linking the $[C_nF_{2n-1}(HF)_x]$ group.

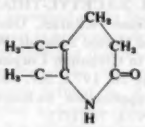
3,944,559

PROCESS FOR THE PRODUCTION OF ALKYL-SUBSTITUTED UNSATURATED α-LACTAMS

Martin Cherubim, Rheinkamp-Eick, and Faisal Abodagga, Rheinkamp-Utfort, both of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed Sept. 7, 1973, Ser. No. 395,307
Claims priority, application Germany, Sept. 14, 1972, 2245097
Int. Cl.² C07D 201/08, 211/30
U.S. Cl. 260—297 Z 5 Claims

1. A process for preparing 3,4 dimethyl-2-aza-cyclohexene (3)-one of the formula:



comprising reacting 3-mono-β- -cyanoethyl-butanone-2 with a mixture consisting of a strong mineral acid in an aqueous or aqueous-alcoholic solution.

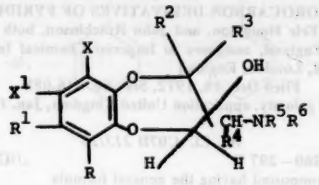
3,944,560

3-HYDROXY-3-(1,2,5-THIADIAZOLYLOXYALKANOL)-3,4-DIHYDRO-2H-1,5-BENZODIOXEPIN PRODUCTS

Burton K. Wasson, Valois, and Haydn W. R. Williams, Dollard des Ormeaux, both of Canada, assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 249,422, May 1, 1972, Pat. No. 3,812,150, which is a division of Ser. No. 832,879, June 9, 1969, Pat. No. 3,700,691, which is a continuation-in-part of Ser. No. 755,442, Aug. 26, 1968, abandoned. This application Nov. 21, 1973, Ser. No. 417,868
Int. Cl.² C07D 285/10
U.S. Cl. 260—302 H 5 Claims

1. A 3,3-disubstituted-benzodioxepin having the structure



and acid addition salts thereof wherein

R is selected from hydrogen, hydroxy, lower alkyl and lower alkoxy;

R^1 is selected from hydrogen, chloro, bromo, lower alkyl, nitro, amino, C_{1-3} alkylsulfonylamino, C_{1-3} alkoxycarbonylamino, lower carbalkoxyamino, hydroxy and lower alkoxy;

X and X^1 are selected from hydrogen, lower alkyl and halogen;

R^2 is selected from hydrogen, lower alkyl, phenyl, phenyl-lower alkyl and lower cycloalkyl;

R^3 is selected from hydrogen, lower alkyl, phenyl and phenyl-lower alkyl;

R^4 is selected from hydrogen and lower alkyl;

R^5 is selected from hydrogen, lower alkyl, and 2-phenyl-2-hydroxyethyl;

R^6 is hydroxyalkyl of a maximum of 4 carbon atoms substituted with ω-(1,2,5-thiadiazolyloxy).

3,944,561

2-METHYL-2-ACETYL-THIAZOLIDINE

Paul Dubs, Zug; Heiner Küntzel, Oberengstringen; Mario Pesaro, Zurich, and Harald Schmidt, Wallisellen, all of Switzerland, assignorz to Givaudan Corporation, Clifton, N.J.

Filed June 28, 1973, Ser. No. 374,714

Claims priority, application Switzerland, July 4, 1972, 9989/72; May 30, 1973, 7821/73

Int. Cl.² C07D *277/04*

U.S. Cl. 260—306.7 R 1 Claim

1. 2-acetyl-2-methyl-thiazolidine.

3,944,562

αS, 4S, 5R α-AMINO-3-CHLORO-4-HYDROXY-2-ISOXAZOLINE-5-ACETIC ACID

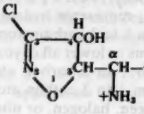
David G. Martin, and Ladislav J. Hanka, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 17, 1974, Ser. No. 461,635

Int. Cl.² C07D *26/04*

U.S. Cl. 260—307 F 8 Claims

1. A composition of matter, essentially pure antibiotic U-43,795, which can be represented by the following structural formula:



and its salts.

3,944,563

1-AMINO-PYRAZOLIC DERIVATIVES

Giorgio Adembri; Piero Tedeschi; Fabio Ponticelli, and Marcsco Marini, all of Florence, Italy, assignors to Etablissements Nativelle, S.A., Paris, France

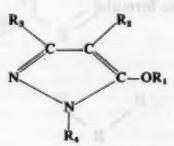
Division of Ser. No. 323,605, Jan. 15, 1973, Pat. No. 3,887,578. This application Mar. 7, 1975, Ser. No. 556,522

Claims priority, application United Kingdom, Jan. 14, 1972, 01864/72

Int. Cl.² C07D *231/46*; A61K *31/415*

U.S. Cl. 260—310 R 3 Claims

1. 1-amino-5 alkoxy-pyrazole compounds of the formula:



(I)

wherein R_1 represents a lower alkyl group having 1 to 4 carbon atoms, R_2 and R_3, which may be identical or different, represent a hydrogen atom, a lower alkyl group, a phenyl group, a phenyl group substituted by one or more groups selected from lower alkyl, halogen, nitro and lower alkoxy; R_4 represents an amino group, a mono-lower alkyl amino group or a di-lower alkyl amino group; as well as their pharmaceutically acceptable salts with a mineral or organic acid.

3,944,564

PREPARATION OF β-COPPER PHTHALOCYANINE WITHOUT MILLING

Albert Robert Hanke, Scotch Plains, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 281,970, Aug. 18, 1972, abandoned. This application Mar. 27, 1974, Ser. No. 455,365

Int. Cl.² C09B *47/04*

U.S. Cl. 260—314.5 1 Claim

1. In a process for the production of copper phthalocyanine pigment by the steps of preparing a solution of crude copper phthalocyanine in concentrated sulfuric acid of at least 70 weight percent strength, drowning the sulfuric acid solution in water or dilute acid flowing at a velocity in excess of the critical velocity to provide high turbulence and produce a slurry of copper phthalocyanine crystals, and thereafter recovering copper phthalocyanine as a pigment, the improvement, for obtaining copper phthalocyanine having a surface area of at least 40 m^2/gram in the β phase without milling, wherein intermediate to the drowning and recovery steps the slurry is maintained under high-speed high-shear agitation with an homogenizer at an acid concentration of less than 40 weight percent and at a temperature of less than about 45°C. for about 5–10 minutes in the presence of

a. a quantity of a water-immiscible halogenated organic liquid at least equal in weight to the crude copper phthalocyanine employed, said organic liquid being selected from the group consisting of orthodichlorobenzene, trichloroethylene, chloroform, perchloroethylene, carbon tetrachloride and trichloromethane, and

b. β-copper phthalocyanine as seed, the particle size thereof being not greater than about 0.05μ and its specific surface area being at least 75 m^2/gram, the seed being em-

ployed in about a 5 weight percent quantity relative to the crude copper phthalocyanine.

3,944,565

PROCESS FOR PREPARING ALKALI METAL SALTS OF CARBAZOLE

Hiroshi Otsuki, Tokyo; Kenzo Sakuma, Fujisawa, and Isamu Matsuzawa, Tokyo, all of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1973, Ser. No. 410,151

Claims priority, application Japan, Oct. 30, 1972, 47-107940

Int. Cl.² C07D 209/86

U.S. Cl. 260—315 8 Claims

1. A process for preparing an alkali metal salt of carbazole, which comprises heating

a. carbazole,

b. an alkali metal hydroxide, and

c. water, wherein the molar ratio of water to said alkali metal hydroxide is about 0.3:1 to 0.35:1 and wherein said water is added to the reaction system prior to said heating,

with stirring in

d. an organic solvent which forms an azeotrope with water, and removing the water formed in the reaction as an azeotrope from the reaction system.

3,944,566

TRICYCLIC SUBSTITUTED AMINOALCOHOLS

Werner Winter, Viernheim; Max Thiel, Mannheim; Kurt Stach, Mannheim-Waldhof; Egon Roesch, Mannheim An Oberen Luisenpark, and Gisbert Sponer, Hemsbach, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

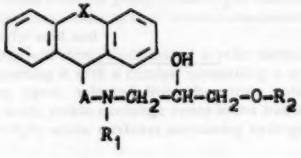
Filed June 28, 1974, Ser. No. 484,353

Claims priority, application Germany, July 14, 1976, 2335943

Int. Cl.² C07D 335/20

U.S. Cl. 260—328 13 Claims

1. Tricyclic substituted aminoalcohol compound of the formula



(I)

wherein

X is ethylene, vinylene, oxygen, sulfur, or oxamethylene,

A is straight-chained or branched alkylene of from 2 to 5 carbon atoms,

R_1 is alkyl of up to 3 carbon atoms; and

R_2 is cyclohexyl or phenyl;

and the physiologically compatible salts thereof.

3,944,567

BENZOTHIENYLISOCYANATES AND ISOTHIOCYANATES AND METHOD OF PREPARATION THEREOF

Goro Asato, Titusville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 5, 1974, Ser. No. 458,272

Int. Cl.² C07D 333/12

U.S. Cl. 260—332.5 6 Claims

1. The compound 4,5,6,7-tetrahydrobenzo[b]thien-4-yl isocyanate.

6. The compound, 2-chloro-4,5,6,7-tetrahydrobenzo[b]thien-4-ylisocyanate.

3,944,568

PROCESS FOR THE PREPARATION OF SELECTIVELY HALOGENATED KETALS

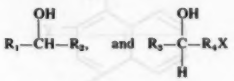
Eddie N. Gutierrez, Fort Lee, and Robert C. Reardon, Jr., Tenafly, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Dec. 20, 1973, Ser. No. 426,771

Int. Cl.² C07D 317/16

U.S. Cl. 260—340.9 12 Claims

1. A method of preparing selectively halogenated ketals which comprises treating with a halogen selected from the group consisting of chlorine and bromine, compounds of the formula:



wherein R_1, R_2, R_3 and R_4 are a straight chain alkyl group of from 1 to 20 carbon atoms, an alkyaryl group wherein the alkyl moiety is a straight chain of from 1 to 20 carbon atoms, R_1, R_2, R_3 and R_4 may be a branched chain alkyl group of from 3 to 20 carbon atoms provided that when either of the pair of R_1, R_2 or R_3, R_4 is a branched chain the other member is a straight chain alkyl group as previously defined, R_1, R_2, R_3 and R_4 may also be phenyl provided that when either of the pair of R_1, R_2 or R_3, R_4 is phenyl the other member is a straight chain group as previously defined, R_1, R_2, or R_3 and R_4 may further be taken together to form a cycloalkyl ring having at least 6 carbon atoms, X is chlorine or bromine, said treatment being in solution in an organic solvent selected from the group consisting of (a) monohydric and polyhydric alcohols of 1 to 5 carbon atoms wherein each C—H group has an hydroxyl group attached thereto, (b) ethanol (c) 2,3-butanediol and (d) propylene glycol and wherein the ratio of said solvent to secondary alcohol or halohydrin is from about 5:1 to about 20:1 and at a temperature of from about 0°C to about 80°C.

3,944,569

AMINOMETHYL-SUBSTITUTED 1-NAPHTHOL PHTHALIDES AND NAPHTHALIDES

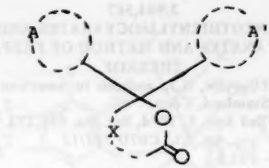
Stanley M. Bloom, Waban; Elbert M. Idelson, Newton Lower Falls; Myron S. Simon, West Newton, and David P. Waller, Arlington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 177,497, Sept. 2, 1971, Pat. No. 3,779,753. This application Aug. 27, 1973, Ser. No. 392,104

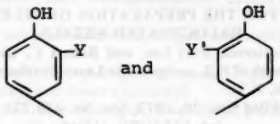
Int. Cl.² C07D 307/77

U.S. Cl. 260—343.3 R 21 Claims

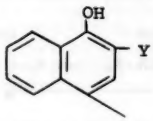
1. An indicator dye having the formula



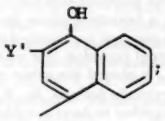
wherein A and A' are



or



and



Y is $-CH_2-NRR'$ wherein R is hydrogen or acyl having the formula

wherein R''' is alkyl having 1 to 20 carbon atoms, naphthyl, phenyl, phenylalkyl wherein said alkyl contains 1 to 12 carbon atoms and p-alkylphenyl wherein said p-alkyl has 1 to 12 carbon atoms and R' is a hydrocarbon group selected from alkyl having 1 to 20 carbon atoms, naphthyl, phenyl, phenylalkyl wherein said alkyl has 1 to 12 carbon atoms and p-alkylphenyl wherein said p-alkylcontains 1 to 12 carbon atoms; Y' is hydrogen or $-CH_2-NRR'$ the same as Y; and X represents the atoms necessary to complete a ring-closing moiety selected from phthalide and naphthalide.

3,944,570

3,3-DISUBSTITUTED PHTHALIDES

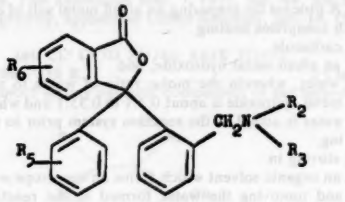
William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 298,601, Oct. 18, 1972, Pat. No. 3,838,174, which is a continuation-in-part of Ser. No. 224,603, Feb. 8, 1972, abandoned. This application June 27, 1974, Ser. No. 483,578

Int. Cl.² C07D *493/00*

U.S. Cl. 260—343.4 **2 Claims**

1. A compound of the formula



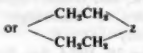
where

R_2 and R_3 each, independently, represent lower alkyl,

or

R_2 and R_3 together represent $(CH_2)_x$

where x represents 4, 5, 6 or 7,



where z represents O, S, or N-R_4

where

R_4 represents lower alkyl,

R_5 and R_6 each, independently, represent H, halo of atomic weight 19–36, lower alkyl, lower alkoxy or trifluorometyl, provided that R_6 may not represent halo at the 6-position or lower alkyl at the 7-position,

or an acid addition salt thereof.

3,944,571

ESTER DERIVATIVES OF PULVINIC ACID

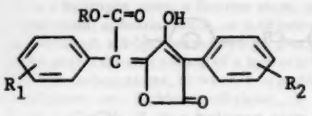
Blaine M. Sutton, Hatboro; Donald T. Walz, Drexel Hill, and James W. Wilson, Wayne, all of Pa., assignors to SmithKline Corporation, Pa.

Division of Ser. No. 191,051, Oct. 20, 1971, Pat. No. 3,826,839, which is a continuation-in-part of Ser. No. 94,974, Dec. 3, 1970, abandoned. This application May 6, 1974, Ser. No. 467,367

Int. Cl.² C07D *307/28*

U.S. Cl. 260—343.6 **5 Claims**

1. A chemical compound of the formula:

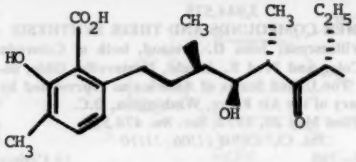


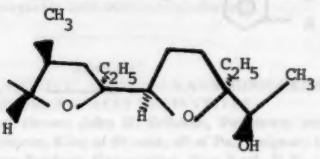
in which:

R is methyl or ethyl; and

R_1 and R_2 are substituents selected as follows so that for a given R_1 in column 1 the corresponding R_2 is in the adjacent position of column 2:

R_1	R_2
hydrogen	3-bromo-4-methoxy
3-bromo-4-methoxy	hydrogen
2-methoxy-5 methyl	2-methoxy-5-methyl
3-chloro-4-fluoro	3-chloro-4-fluoro
hydrogen	3,4-dichloro
4-methylthio	hydrogen
hydrogen	4-methylthio
4-methylsulfinyl	hydrogen
hydrogen	4-methylsulfinyl
4-methylthio	4-methylthio
hydrogen	3-chloro-4-methoxy
hydrogen	2-chloro-5-methyl
3-chloro-2-methyl	hydrogen
hydrogen	3-chloro-2-methyl.





or the pharmaceutically acceptable salts thereof.

3,944,572
LACTONES

Ian Robert King, and Francis R. F. Hardy, both of Luton, England, assignors to Laporte Industries Limited, Luton, England

Filed Apr. 5, 1974, Ser. No. 458,395

Claims priority, application United Kingdom, Apr. 11, 1973, 17497/73

Int. Cl.² C07D *307/32*

U.S. Cl. 260—343.6 **6 Claims**

1. A process for the production of a γ-caprolactone comprising

a. heating an ε-caprolactone in the vapour phase at a temperature below 400°C in the presence of a cracking catalyst selected from the group consisting of aluminosilicates and refractory oxides to form a mono-unsaturated acyclic carboxylic acid and

b. cyclising said mono-unsaturated acyclic carboxylic acid by contacting it with a catalyst comprising a strong protonating agent, selected from the group consisting of strong acids, cation exchange resins in the free acid form, and strongly acidic mixtures containing hydrogen ions.

3,944,573
ISO-LASALOCID A

John Westley, Mountain Lakes, N.J., assignor to Hoffman-La Roche Inc., Nutley, N.J.

Filed Apr. 2, 1974, Ser. No. 457,298

Int. Cl.² C07D *307/12*

U.S. Cl. 260—347.3 **2 Claims**

1. A compound of the formula:

3,944,574
AZIDO-SILANE COMPOSITIONS

James Glenn Marsden, Amawalk, and Peter Joseph Orenski, Ossining, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 26, 1974, Ser. No. 483,365

Int. Cl.² C07C *117/00*

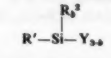
U.S. Cl. 260—349 **13 Claims**

1. A solubilized azido-containing silane composition of matter produced by a process which comprises reacting in the presence of a non-aqueous solvent

a. an azido-containing carboxylic acid halide of the formula

$$(N_3X)_a—Ar—(R)_n—COHal$$

wherein X is a radical selected from the group consisting of sulfonyl and formyl radicals, *a* is an integer of from 1 to 2, Ar is an aryl radical, R is a divalent alkylene radical having from 1 to 17 carbon atoms, wherein *n* has a value of 0 or 1; and Hal represents a halogen radical, with (b) an amino-containing silane having the formula



wherein R^2 is a monovalent hydrocarbon radical, *b* has a value of 0 to 2, Y is a hydrolyzable group selected from the class consisting of alkoxy and aryloxy radicals and wherein R′ is an organic radical directly bonded to the silicon atom of said silane through a carbon to silicon bond, said organic radical further containing at least one nitrogen atom which has a hydrogen atom bonded directly to it, said solvent being present in an amount sufficient to solubilize the azido-containing silane product of (a) and (b).

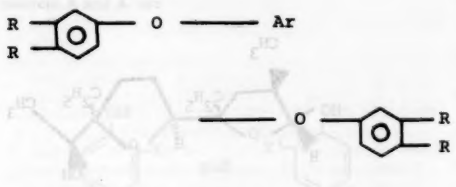
3,944,575

ARYL ETHER COMPOUNDS AND THEIR SYNTHESIS

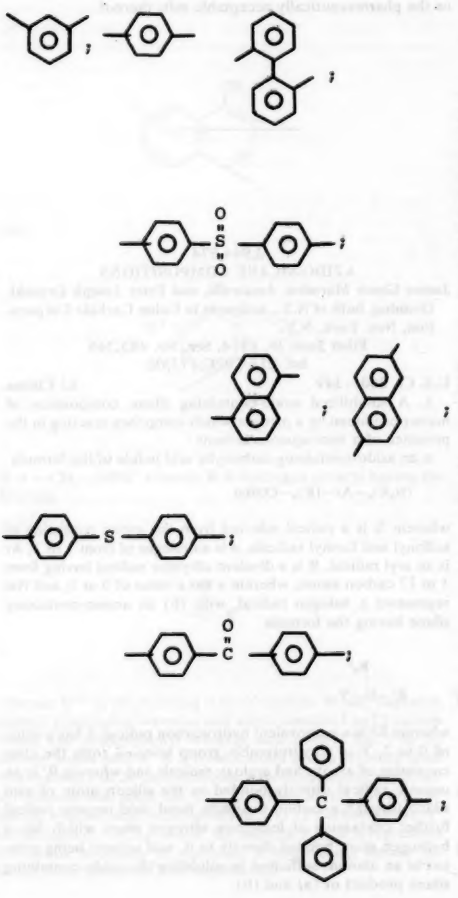
Frank W. Villaescusa; John G. Breland, both of Colorado Springs, Colo., and Fred E. Arnold, Centerville, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 30, 1974, Ser. No. 474,560
Int. Cl.² C09B 11/06, 11/10
U.S. Cl. 260—395 14 Claims

1. As a new composition of matter, an arylene-oxy compound having the following formula:



where R is NO_2, NH_2 or NH_3Cl, and wherein Ar is



3,944,576

NOVEL STEROIDS OF THE OESTRANE SERIES SUBSTITUTED IN 7-POSITION

Albertus Joannes van den Broek, and Jacob de Visser, both of Oss, Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Mar. 27, 1974, Ser. No. 455,488
Claims priority, application Netherlands, Apr. 13, 1973, 7305171
Int. Cl.² C07J 1/00
U.S. Cl. 260—397.5 5 Claims

1. A 7-substituted steroid of the oestrane series, selected from the group consisting of 7α-methoxymethyl-17α-ethynyl-Δ^4-oestren-17β-ol, 7α-methoxymethyl-17α-ethynyl-$\Delta^{1,3,5(10)}$-oestratriene-3,17β-diol, 7α-hydroxymethyl-17α-ethynyl-$\Delta^{1,3,5(10)}$-oestratriene-3,17β-diol, and 7α-methoxymethyl-$\Delta^{1,3,5(10)}$-oestratriene-3,16α,17β-triol.

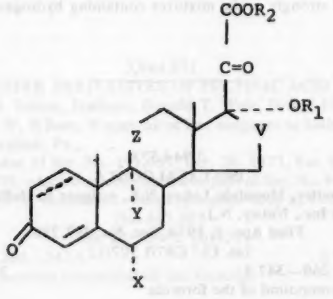
3,944,577

NOVEL PREGNANE-21-OIC ACID DERIVATIVES

Henry Laurent, and Rudolf Wiechert, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Dec. 19, 1974, Ser. No. 534,482
Claims priority, application Germany, Dec. 21, 1973, 2365102; Aug. 27, 1974, 2441284; Sept. 16, 1974, 24446182
Int. Cl.² C07J 9/00
U.S. Cl. 260—397.1 53 Claims

1. A pregnane-21-oic acid derivative of the formula



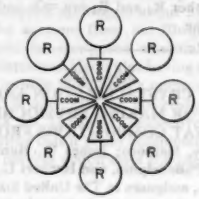
wherein X is a hydrogen atom, a fluorine atom, or methyl; Y is a hydrogen atom, a fluorine atom, or a chlorine atom; Z is methylene, carbonyl, a β-hydroxymethylene, β-acyloxymethylene whereby acyl is the acyl radical of a hydrocarbon carboxylic acid of 1–8 carbon atoms, or when Y is a chlorine atom, β-fluoromethylene or β-chloromethylene; V is $>CH_2$, $>CHCH_3$ or $>C{=}CH_2$; R_1 is a hydrogen atom or the acyl radical of a hydrocarbon carboxylic acid of 1–8 carbon atoms, and R_2 is a hydrogen atom or alkyl of 1–8 carbon atoms, and the bond ⎓ represents a single or double bond, and, when R_2 is H, the physiologically acceptable metal and ammonium salts thereof.

3,944,578

ORGANIC SUPERCONDUCTORS WITH HIGH TRANSITION TEMPERATURES AND HIGH CRITICAL MAGNETIC FIELDS

Alfred A. Wolf, and Ernest H. Halpern, both of Annapolis, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 23, 1973, Ser. No. 418,337
Int. Cl.² C07J 9/00
U.S. Cl. 260—397.1 **15 Claims**



1. A method of preparing a superconductive material of the formula $(RCOO^-)_xM^x$, wherein R is selected from the group consisting of a metal, a cyclic organic radical, an aliphatic organic radical, an aromatic organic radical, and a heterocyclic organic radical; M is a cation; and x is the valence of M, comprising the steps of:

preparing a water solution of the material at room temperature;

establishing a vacuum over said solution; and

evaporating slowly the solvent to cause the constituent molecules to orient with the COOM group in clusters surrounded by a matrix of the R group.

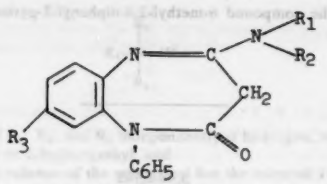
3,944,579

2-AMINO-5-PHENYL-4H-3,5-DIHYDRO-1,5-BENZODIAZEPIN-4-ONES AND SALTS THEREOF

Adolf Bauer, Ingelheim am Rhein; Karl Heinz Weber; Klaus Minck, both of Gau-Algesheim, and Peter Danneberg, Ingelheim am Rhein, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Continuation-in-part of Ser. No. 194,001, Oct. 29, 1971, Pat. No. 3,862,136. This application July 10, 1974, Ser. No. 487,221
Claims priority, application United Kingdom, July 11, 1973, 33044/73; Oct. 23, 1973, 49219/73
Int. Cl.² C07D 243/12
U.S. Cl. 260—239.3 B **3 Claims**

1. A compound of the formula



wherein

R_1 and R_2 are each hydrogen or methyl, and

R_3 is chlorine, bromine or nitro, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

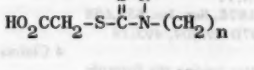
3,944,580

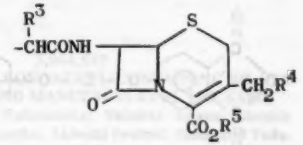
7-[2-(DITHIOCARBOXYLAMINO)ALKANAMIDO]-CEPHALOSPORANIC ACID DERIVATIVES

Daniel M. Teller, Devon; John H. Sellstedt, Pottstown, and Charles J. Guinosso, King of Prussia, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 17, 1974, Ser. No. 515,751
Int. Cl.² C07D 501/28, 501/34
U.S. Cl. 260—243 C **4 Claims**

1. A compound of the formula:





in which

R^2 is —H or alkyl of 1 to 6 carbon atoms;

R^3 is —H, alkyl of 1 to 6 carbon atoms or phenyl;

R^4 is —H, alkanoyloxy of 2 to 6 carbon atoms, or

when R^5 is —H;

R^5 is —H or an alkali metal;

n is one of the integers 0 and 1;

or an alkali metal salt thereof.

3,944,581

5-SUBSTITUTED-2,4-DIPHENYLPYRIMIDINES

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Nov. 1, 1974, Ser. No. 520,024
Int. Cl.² C07D 239/26
U.S. Cl. 260—251 R **2 Claims**

1. The compound 2,4-diphenyl-5-pyrimidyl methyl ketone.

2. The compound α-methyl-2,4-diphenyl-5-pyrimidinemethanol.

3,944,582

CARBAMATES OF ERGOLINES

Giorgio Ferrari, and Jiri Jan Krepinsky, both of Milan, Italy, assignors to Simes Societa Italiana Medicinali e Sintetici S.p.A., Milan, Italy

Filed May 20, 1974, Ser. No. 471,701
Claims priority, application Italy, May 23, 1973, 24513/73
Int. Cl.² C07D 457/06, 457/08
U.S. Cl. 260—285.5 26 Claims

1. D-6-methyl-8β-(N,N-dimethylcarbamoylmethyl)-9,10-didehydroergoline.

26. D-6-methyl-8β-(perhydroazepinylcarbonyloxymethyl)-ergoline.

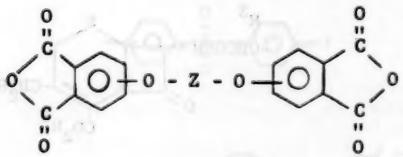
3,944,583

BIS-PHENOXYPHTHALIC ACID ANHYDRIDES

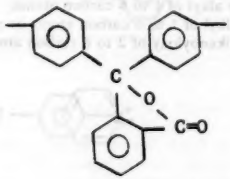
Clayton B. Quinn, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 27, 1975, Ser. No. 553,658
Int. Cl.² C07D 493/04, 493/14
U.S. Cl. 260—343.4 4 Claims

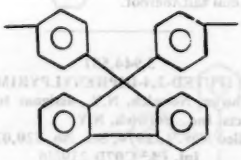
1. A composition of matter having the formula



where Z is a member selected from the class consisting of the



group and the



group.

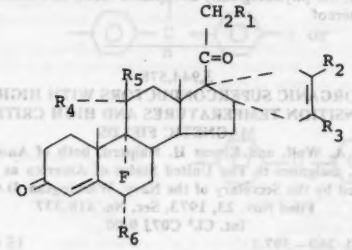
3,944,584

STEROIDAL (16α,17-D)CYCLOHEXENES

Sam T. Chao, Cranbury; Christopher M. Cimarusti, Hamilton, and Ravi K. Varma, Belle Mead, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 3, 1975, Ser. No. 546,647
Int. Cl.² C07J 5/00
U.S. Cl. 260—397.3 15 Claims

1. A steroid having the formula



or the 1,2-dehydro derivative thereof, wherein R_1 is hydrogen, hydroxy, halogen, or acyloxy; R_2 and R_3 are the same or different and are hydrogen, alkyl, or aryl; R_4 is hydrogen and R_5 is hydroxy, or together R_4 and R_5 are =O; and R_6 is hydrogen, methyl, or fluorine.

3,944,585

MULTI-STEP CRYSTALLIZATION AND BLENDING PROCESS FOR MAKING PHYSIOCHEMICALLY DESIGNED FAT COMPOSITIONS FROM TALLOW

Francis E. Luddy, Hatboro; James W. Hampson; Samuel F. Herb, both of Philadelphia, and Herbert L. Rothbart, Flourtown, all of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 5, 1973, Ser. No. 337,789
Int. Cl.² C11B 3/00, 7/00
U.S. Cl. 260—428.5 1 Claim

1. A process for partitioning beef tallow into five well defined fractions whereby each fraction had its own distinctive fatty acid and glyceride composition and its own thermal characteristics and whereby two of said fractions are crystalline, two are liquid and one is a plastic solid, comprising the steps of:

a. dissolving the tallow in acetone, said acetone and tallow being at a ratio of 10 to 1 on a volume/weight basis;

b. crystallizing the solution from step (a) at about 25°C. for about 12 to 20 hours;

c. filtering the solution and collecting the precipitate formed in step (b), said precipitate being a high melting crystalline solid composed essentially of trisaturated glycerides and a minor amount of disaturated monounsaturated glycerides having a gas-liquid chromatographic profile indicating a composition containing 12%, 31%, 39% and 18% of glycerides having carbon numbers of 48, 50, 52 and 54, respectively, and a thermal profile indicating softening of the crystalline solid at about 40°C., rapid melting beginning at about 50°C. and complete melting at about 57°C.;

d. crystallizing the filtrate from step (c) at about 2°C. for about 16 to 18 hours, the ratio of acetone to solute having been adjusted to 10 to 1 on a volume/weight basis;

e. filtering the solution and collecting the precipitate formed in step (d);

f. removing the solvent from the filtrate of step (e) to obtain a liquid fat composed essentially of monosaturated, triunsaturated glycerides having a gas-liquid chromatographic profile indicating a composition containing 5%, 22%,

44% and 29% of glycerides having carbon numbers of 48, 50, 52 and 54, respectively, and a thermal profile indicating that it is not completely solid at −15°C. and that the portion which does solidify at −15°C. melts at about 5°C.;

g. dissolving the precipitate from step (e) in acetone at an acetone/solute ratio of 20 to 1 and crystallizing at about 15°C. for about 16 to 18 hours;

h. filtering the solution and collecting the precipitate formed in step (g), said precipitate being a crystalline solid composed essentially of trisaturated glycerides and a minor amount of disaturated monounsaturated glycerides having a gas-liquid chromatographic profile indicating a composition containing 15%, 28%, 36% and 21% of glycerides having carbon numbers of 48, 50, 52, and 54, respectively, and a thermal profile indicating softening and commencement of melting at about 42°C. and complete melting at about 51°C.;

i. crystallizing the filtrate from step (h) at about 2°C. for about 16 to 18 hours, the ratio of acetone to solute having been adjusted to 15 to 1 on a volume/weight basis;

j. filtering the solution and collecting the precipitate formed in step (i) said precipitate being a plastic solid composed essentially of disaturated glycerides with minor amounts of trisaturated and monounsaturated diunsaturated glycerides having a gas-liquid chromatographic profile indicating a composition containing a trace %, 30%, 49% and 21% of glycerides having carbon numbers of 48, 50, 52 and 54, respectively, and a thermal profile indicating softening at about 20°C., rapid melting beginning at about 30°C. and complete melting at about 37°C; and

k. removing the acetone from the filtrate of step (j) to obtain a liquid fat composed essentially of monosaturated, trinunsaturated glycerides having a gas-liquid chromatographic profile indicating a composition containing 4%, 18%, 45% and 33% of glycerides having carbon numbers of 48, 50, 52 and 54, respectively, and a thermal profile indicating that it is not completely solid at −15°C. and that the portion which does solidify at −15°C. melts at about 5°C.

3,944,586

PREPARATION OF SALTS OF ANTIMONY (V) ESTERS

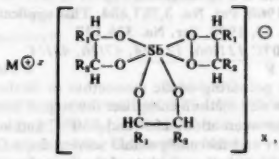
Richard Norris Knowles, Hockessin, Del. 19707

Division of Ser. No. 204,704, Dec. 3, 1971, Pat. No. 3,836,557. This application Jan. 22, 1974, Ser. No. 435,495

Int. Cl.² C07F 3/08; C07C 31/28; C07F 9/90

U.S. Cl. 260—429 R **4 Claims**

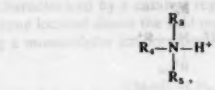
1. A process for the preparation of a compound of the formula



wherein

each of R_1 and R_2 independently is hydrogen or methyl:

M is the cation of lithium, sodium, potassium, magnesium, calcium, strontium, barium, zinc, cadmium, guanidinium, ethylenediammonium, or ammonium having the following formula

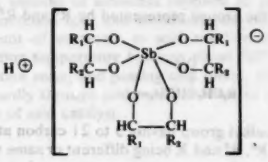


wherein

each of R_3, R_4, and R_5 independently is hydrogen, methyl, ethyl or 2-hydroxyethyl; and

x is the valence of the cation and has the value of 1 or 2;

said process comprising the reaction of the compound of formula



with the hydroxide or carbonate of the cation $M^{\oplus x}$ in a glycol containing vicinal hydroxy groups, at a temperature below the decomposition temperature of the resulting salt; in the presence of 0–30 weight percent of water based on the total solvent mixture.

3,944,587

HYDROXYPOLYFLUOROALKYL-CONTAINING SILANE DERIVATIVES AND MANUFACTURING THE SAME

Atsuo Katsushima, Takarazuka; Shinichi Imazu; Shoshin Fukui, both of Toyonaka; Akitoshi Iwatani, Suita, and Tadashi Akazawa, Ibaragi, all of Japan, assignors to Daikin Kogyo Kabushiki Kaisha, Osaka, Japan

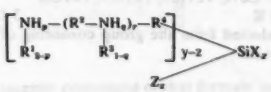
Filed Apr. 10, 1974, Ser. No. 459,726

Claims priority, application Japan, Apr. 14, 1973, 48-42402

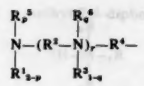
Int. Cl.² C07F 7/04, 7/10, 7/18

U.S. Cl. 260—448.8 R **13 Claims**

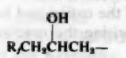
1. A hydroxypolyfluoroalkyl-containing silane derivative having the formula



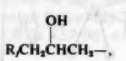
wherein each of R^1 and R^3 is an alkyl group having 1 to 5 carbon atoms; each of R^2 and R^4 is an alkylene group having 1 to 5 carbon atoms; X is an alkoxyl group having 1 to 5 carbon atoms, alkyl group having 1 to 5 carbon atoms, hydroxyl group, chlorine atom or hydrogen atom and at least one of the groups represented by X is an alkoxyl group having 1 to 5 carbon atoms, hydroxyl group, chlorine atom or hydrogen atom; p is zero or an integer of 1 or 2, q is zero or an integer of 1, r is zero or an integer of 1 to 5, y is an integer of 1 or 2 and x is an integer of 2 or 3, provided that the sum of p and qr is at least 1 and the sum of x and y is 4; z is an integer of 1 or 2 equal to or less than that represented by y; and Z is a group represented by



wherein R^1, R^2, R^3, R^4, p, q and r are the same as defined above and each of R^5 and R^6 is a hydrogen atom or



and at least one of the groups represented by R^5 and R^6 is



R_f being a perfluoroalkyl group having 3 to 21 carbon atoms; each of said R^2, R^4, R^5, R^6 and X being different or same when plural in number.

3,944,588

CATALYTIC PROCESS FOR POLYHYDRIC ALCOHOLS AND DERIVATIVES

Leonard Kaplan, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 2, 1975, Ser. No. 537,863

Int. Cl.² C07C *27/06, 29/16*

U.S. Cl. 260—449 L **14 Claims**

1. The process of making alkane diols and triols having from 2 to 3 carbon atoms in the molecule which comprises reacting in a homogeneous liquid phase mixture of hydrogen and oxides of carbon in the presence of a rhodium carbonyl complex and a trialkanolamine borate at a pressure of from about 1000 psia to about 50,000 psia correlated with a temperature of about 100°C to about 375°C sufficient to produce said diols and triols.

3,944,589

α-CYCLOALKENYLPHENYL-FATTY ACID NITRILES

Alberto Rossi, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

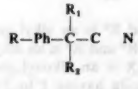
Division of Ser. No. 92,327, Nov. 23, 1970, Pat. No. 3,822,309, which is a continuation-in-part of Ser. No. 862,443, Sept. 30, 1969, abandoned. This application Apr. 3, 1974, Ser. No. 457,521

Claims priority, application Switzerland, Oct. 11, 1968, 15240/68; Nov. 6, 1968, 16569/68; May 8, 1969, 7083/69; Aug. 21, 1969, 12707/69; Feb. 11, 1970, 1985/70; May 25, 1970, 7728/70; June 15, 1970, 89990/70; June 22, 1970, 9481/70

Int. Cl.² C07C *121/66, 121/75, 121/78*

U.S. Cl. 260—465 K **3 Claims**

1. A member selected from the group consisting of compounds of the formula



in which *Ph* stands for a member selected from the group consisting of ortho-phenylene, ortho-phenylene substituted by a member selected from the group consisting of lower alkyl, lower alkoxy, halogen, trifluoromethyl, amino, nitro and hydroxy, para-phenylene and paraphenylene substituted by a member selected from the group consisting of lower alkyl, lower alkoxy, halogen, trifluoromethyl, amino, nitro and hydroxy, R stands for a member selected from the group consisting of 1-cycloalkenyl having 4–8 ring carbon atoms and 1-cycloalkenyl having 4–8 ring carbon atoms substituted by a member selected from the group consisting of lower alkyl, lower alkoxy, lower alkenyloxy, hydroxy, oxo, amino, monolower alkylamino, di-lower alkylamino, lower alkyleneamino, lower oxaalkyleneamino, lower thiaalkyleneamino and lower azaalkyeneamino and R_1 and R_2 each stands for a member selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower alkinyl, phenyl-lower alkyl, phenyl-lower alkyl substituted by a member selected from the group consisting of lower alkyl, lower alkoxy, halogen and trifluoromethyl, phenyl-lower alkenyl and phenyllower alkenyl substituted by a member selected from the group consisting of lower alkyl, lower alkoxy, halogen and trifluoromethyl, and when taken together R_1 and R_2 stand for lower alkylidene.

3,944,590

PROCESS FOR THE TEMPORARY PROTECTION OF AMINO GROUPS IN PEPTIDE SYNTHESES

Beat Iselin, Riehen, and Peter Sieber, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

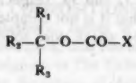
Division of Ser. No. 239,721, March 30, 1972, Pat. No. 3,875,207, which is a continuation-in-part of Ser. No. 698,118, Jan. 16, 1968, abandoned. This application Aug. 29, 1974, Ser. No. 501,565

Claims priority, application Switzerland, Jan. 25, 1967, 1073/67; Aug. 28, 1967, 12038/67; Dec. 6, 1967, 17108/67

Int. Cl.² C07C *69/96*

U.S. Cl. 260—463 **7 Claims**

1. A compound of the formula II



in which R_1 is lower alkyl, R_2 is lower alkyl or phenyl and R_3 is phenyl and wherein phenyl is unsubstituted or substituted by lower alkyl, phenyl or lower alkylphenyl and X stands for phenyloxy or p-nitrophenyloxy.

3,944,591

ENOLIC ETHERS OF ADIPIC DIALDEHYDE AND METHOD FOR PREPARING THE SAME

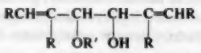
Andre Bader, 65 rue Henri Barbusse, and Francis Weiss, 3 chemin du Perron, both of (69) Pierre Benite, France

Continuation of Ser. No. 711,842, March 11, 1968, abandoned, which is a continuation-in-part of Ser. No. 702,524, Feb. 2, 1968, Pat. No. 3,787,484. This application Jan. 23, 1973, Ser. No. 326,137

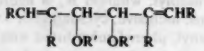
Int. Cl.² C07C *121/66, 121/34, 47/26, 43/14*

U.S. Cl. 260—465 F **4 Claims**

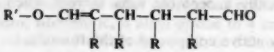
1. A method for preparing enolic monoether or diether of adipic dialdehyde which method comprises the step of heating to a temperature between about 150° and 450° C and in the presence of an inert and thermally stable solvent for a Cope rearrangement a monoether or diether of the formulas



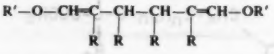
or



respectively, wherein each R is a hydrogen atom, an alkyl of 1 to 4 carbon atoms, phenyl, or phenyl having substituted therein an alkyl of 1 to 4 carbon atoms, a halogen, hydroxyl, methoxy, ethoxy, carboxy, carbomethoxy, carboethoxy, or methylol substituent, and each R′ is an alkyl of 1 to 4 carbon atoms or a halogen, hydroxy, or cyano mono-substituted alkyl of 1 to 4 carbon atoms, and recovering the corresponding enolic monoether or diether of adipic aldehyde of the formulas

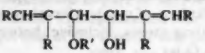


or

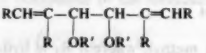


respectively.

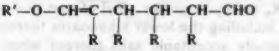
3. A method for preparing enolic monoether or diether of adipic dialdehyde which method comprises the step of heating to a temperature between about 150° and 450° C and in the vapor phase for a Cope rearrangement a monoether or diether of the formulas



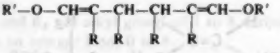
or



respectively, wherein each R is a hydrogen atom, an alkyl radical of 1 to 4 carbon atoms, phenyl, or phenyl having substituted therein an alkyl of 1 to 4 carbon atoms, a halogen, hydroxyl, methoxy, ethoxy, carboxy, carbomethoxy, carbomethoxy, carboethoxy, or methylol substituent; and each R′ is an alkyl of 1 to 4 carbon atoms or a halogen, hydroxy, or cyano monosubstituted alkyl of 1 to 4 carbon atoms, and recovering the corresponding enolic monoether of diether of adipic aldehyde of the formulas



or



respectively.

3,944,592

METHOD OF PRODUCING UNSATURATED NITRILES

Harold R. Sheely, Orleans, Mass., assignor to The Badger Company, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 39,592, May 22, 1970, abandoned. This application Dec. 20, 1973, Ser. No. 426,900

Int. Cl.² C07C *120/14*

U.S. Cl. 260—465.3 **14 Claims**

9. A process for producing an unsaturated nitrile by the reaction of an unsaturated olefin with ammonia and oxygen in a reactor containing a fluidized bed of an ammoxidation catalyst characterized by a catalyst regeneration zone and a reaction zone located above the said regeneration zone, said olefin being a mono-olefin having the structure

where R is hydrogen or methyl, said process comprising the steps of introducing all of said unsaturated olefin into said reaction zone, introducing all of said oxygen into said regeneration zone, introducing between 3 and about 90 percent of the total amount of ammonia supplied to said reaction to said regeneration zone and introducing the remainder of said total amount of ammonia to said reaction zone, maintaining a reaction temperature between about 500° and 1000°F in said reaction zone, and passing said olefin, ammonia and oxygen upwardly through said reaction zone for reaction in the presence of said catalyst.

3,944,593

3-OXA PROSTAGLANDIN E-TYPE COMPOUNDS

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

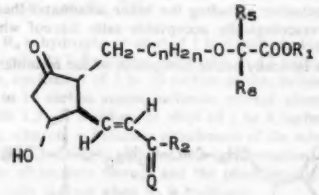
Continuation of Ser. No. 332,201, Feb. 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 272,444, July 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 47,169, June 17, 1970, abandoned. This application Apr. 17, 1974, Ser. No. 461,497

Claims priority, application United Kingdom, July 29, 1969, 38073/69

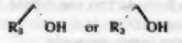
Int. Cl.² C07C *61/38, 69/74*

U.S. Cl. 260—468 D **70 Claims**

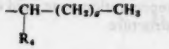
1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein C_nH_{2n} is alkylene of one to 10 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, between —CH_2— and —O—; wherein Q is

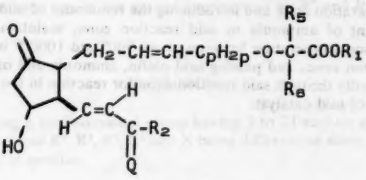


wherein R_3 is hydrogen or methyl; wherein R_1 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3 chloro; wherein R_5 is

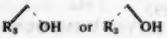


wherein R_4 is hydrogen or fluoro and g is one, 2, 3, 4, or 5; and wherein R_5, R_6, are hydrogen or alkyl of one to 4 carbon atoms, inclusive; including the lower akanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

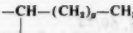
18. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein C_pH_{2p} is alkylene of one to 8 carbon atoms, inclusive, with one, 2, or 3 carbon atoms, between —CH=CH— and —O—; wherein Q is

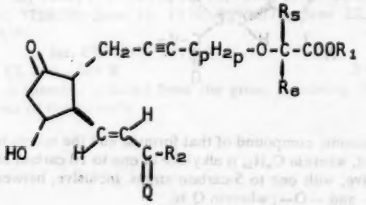


wherein R_3 is hydrogen or methyl; wherein R_1 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3 chloro; wherein R_2 is

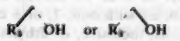


wherein R_4 is hydrogen or fluoro and g is one, 2, 3, 4, or 5; and wherein $R_5$and R_6 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

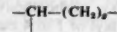
36. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein C_pH_{2p} is alkylene of one to 8 carbon atoms, inclusive, with one, 2, or 3 carbon atoms, between —C C— and —O—; wherein Q is

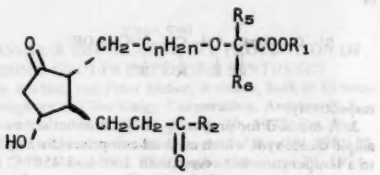


wherein R_3 is hydrogen or methyl; wherein R_1 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3 chloro; wherein R_2 is

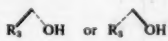


wherein R_4 is hydrogen or fluoro and g is one, 2, 3, 4, or 5; and wherein R_5 and R_6 are hydrogen or alkyl of one to 4 carbon atoms inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

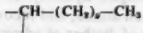
53. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein C_nH_{2n} is alkylene of one to 10 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, between —CH_2— and —O—; wherein Q is

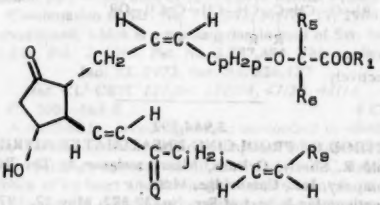


wherein R_3 is hydrogen or methyl; wherein R_1 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3 chloro; wherein R_2 is

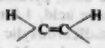


wherein R_4 is hydrogen or fluoro and g is one, 2, 3, 4, or 5; and wherein R_5 and R_6 are hydrogen or alkyl of one to 4 carbon atoms, inclusive, including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

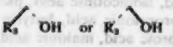
70. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein C_jH_{2j} is alkylene of one to 4 carbon atoms, inclusive; wherein C_pH_{2p} is alkylene of one to 8 carbon atoms, inclusive, with one, 2, or 3 carbon atoms between



and —O—; wherein Q is



wherein R_3 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the beta position with 3 chloro; wherein R_2 is alkyl of one to 4 carbon atoms, inclusive, substituted with zero, one, 2, or 3 fluoro; and wherein R_5 and R_6 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

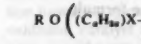
3,944,594

POLYALKYLENE GLYCOL ESTERS OF HINDERED PHENOLS SUBSTITUTED ALKANOIC ACID

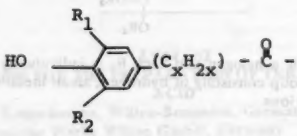
Eduard K. Kleiner, New York, and John D. Spivack, Spring Valley, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 52,724, July 16, 1970, abandoned. This application Nov. 23, 1973, Ser. No. 418,706
The portion of the term of this patent subsequent to Nov. 16, 1991, has been disclaimed.
Int. Cl.² C07C *69/76, 69/78*
U.S. Cl. 260—473 S **11 Claims**

1. A compound of the formula:



wherein
a is an integer from 2 to 6,
b is an integer from 3 to 40, and
R is



wherein
R_1 and R_2 are alkyl group of 1 to 8 carbon atoms,
x is an integer from 0 to 6.

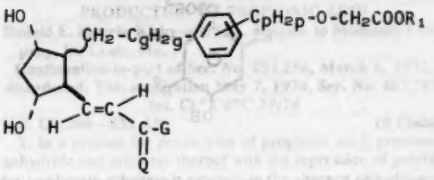
3,944,595

PGF, α -OXAPHENYLENE COMPOUNDS

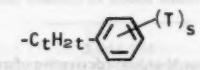
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 302,567, Oct. 30, 1972, which is a continuation-in-part of Ser. No. 121,572, March 5, 1971, abandoned. This application July 18, 1974, Ser. No. 489,934
Int. Cl.² C07C *65/22, 69/76*
U.S. Cl. 260—473 A **31 Claims**

1. An optically active compound of the formula:

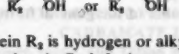


or a racemic mixture of that compound and the enantiomer thereof, wherein C_eH_{2e} represents a valence bond or alkylene of 1 to 4 carbon atoms, inclusive, with 1 or 2 chain carbon atoms between —CH_2— and the phenylene ring; wherein C_pH_{2p} represents a valence bond or alkylene of 1 to 4 carbon atoms, inclusive, with 1 or 2 chain carbon atoms between the ring and the —O—; wherein C_eH_{2e} and C_pH_{2p} together represent zero to 8 carbon atoms, inclusive, with total chain lengths 0 to 3 carbon atoms, inclusive; wherein G is (1) alkyl of 2 to 10 carbon atoms, inclusive, substituted with 0,1, 2, or 3 fluoro or (2) a monovalent moiety of the formula



wherein C_tH_{2t} represents a valence bond or alkylene of 1 to 10 carbon atoms, inclusive, substituted with 0,1, or 2 fluoro, with 1 to 7 carbon atoms, inclusive, between

and the ring, wherein T is alkyl of 1 to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR_6, wherein R_6 is hydrogen or alkyl of 1 to 4 carbon atoms, inclusive, and wherein *s* is 0,1, 2, or 3, with the proviso that not more than two T's are other than alkyl; wherein Q is



wherein R_3 is hydrogen or alkyl of 1 to 4 carbon atoms, inclusive; wherein R_1 is hydrogen, alkyl of 1 to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with 1,2, or 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive; wherein ~ indicates attachment of the side chain to the cyclopentane ring in alpha or beta configuration; including the lower alkanoates thereof and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

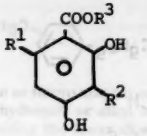
3,944,596

PROCESS FOR THE PREPARATION OF 3-MONO-ALKYL AND 3,6-DIALKYL-RESORCYLIC ESTERS

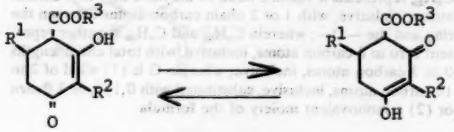
Amnon Mordechai Cohen, Amersfoort, Netherlands, assignor to P.F.W. Beheer B.V., Amersfoort, Netherlands

Filed Nov. 23, 1973, Ser. No. 418,796
Claims priority, application United Kingdom, Nov. 29, 1972, 55067/72; June 22, 1973, 29647/72
Int. Cl.² C07C *69/84*
U.S. Cl. 260—473 S **15 Claims**

1. A process for the preparation of mono- and di-alkylresorcylic esters of the general formula



wherein R^1 is hydrogen or an alkyl radical containing up to three carbon atoms, R^2 represents an alkyl radical having up to three carbon atoms, and R^3 represents methyl or ethyl, which consists essentially of reacting the corresponding dihydroresorcylic esters represented by the general formula



with an N-bromo- or N-chloro- derivative of an amide selected from the class consisting of acetamide, aromatic amides, caprolactam, succinimide, phthalimide, saccharin, and N,N-dihalohydantoins, in an inert solvent at a temperature between room temperature and the reflux temperature of the solvent employed.

3,944,597

ESTERS OF TETRAHALO-OCTANOLS

Kenneth Rowland Dobson, Epsom Downs, England, assignor to BP Chemicals International Limited, England

Continuation-in-part of Ser. No. 387,951, Aug. 13, 1973, Pat. No. 3,890,375. This application Feb. 10, 1975, Ser. No. 548,556

Claims priority, application United Kingdom, Aug. 25, 1972, 39644/72

Int. Cl.² C07C *69/14*, *69/24*, *69/63*

U.S. Cl. 260—488 F 7 Claims

1. An ester of a linear C_8 alcohol of the general formula:

$$Z(CH_2)_3.Z^1.CH_2.O.CO.R$$

or

$$Z(CH_2)_3.CH(Z).O.CO.R$$

wherein

Z is $XCH_2.CHX-$,

Z^1 is $-CHX.CHX-$,

X is Cl or Br, and

R is hydrogen, lower alkyl of 1–6 carbon atoms or halogenated lower alkyl of 1–6 carbon atoms.

3,944,598

PRODUCTION OF AMINE SALTS OF CARBOXYLIC ACIDS

John E. Paustian, Whippany, and Abraham P. Gelbein, Plainfield, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed June 21, 1973, Ser. No. 372,047

Int. Cl.² C07C *87/00*; C07D *295/00*, *213/00*, *307/00*

U.S. Cl. 260—501.1 17 Claims

1. A process for hydrolizing at least one member selected from the group consisting of the nitriles, amides and imides of benzoic acid, phthalic acid, isophthalic acid, terephthalic acid, trimellitic acid, trimesic acid, hemimellitic acid, pyromellitic acid, prehnitic acid, mellitic acid, naphthalic acid, 1,8-naphthalene-dicarboxylic acid, 2,6-naphthalene-dicarboxylic acid, 2-, 3- and 4-biphenyl carboxylic acids, diphenic acid, 1-, 2- and 9-anthroic acids, tetrachlorophthalic acid, terephthalamic acid, 4-hydroxyisophthalic acid, phthalaldehydic acid, o-, m- and p-toluic acids, nicotinic acid, isonicotinic acid, picolinic acid, furoic acid, acetic acid, proprionic acid, butyric acid, isobutyric acid, valeric acid, caproic acid, malonic acid, succinic acid, propylmalonic acid, adipic acid, glutaric acid, 2-methylglutaric acid, mucic acid, tartaric acid, citric acid, acrylic, methacrylic acid, ethylacrylic acid, β,β-dimethylacrylic acid, crotonic acid, maleic acid, fumaric acid, allymalonic acid and sorbic acid, comprising:

effecting said hydrolysis with an aqueous amine solution at a temperature of from 100°F to about 500°F; said amine being selected from the group consisting of alkyl amines, hexamethylenetetramine, pyridine, picolines, lutidines, benzyl amine and xylylamine; and removing evolved ammonia to produce the amine salt of the acid.

3,944,599

SUBSTITUTED ETHANE DIPHOSPHONIC ACIDS AND SALTS

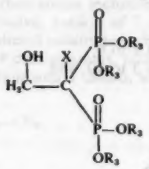
Al F. Kerst, Littleton, Colo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 283,147, Aug. 23, 1972, Pat. No. 3,833,690, which is a division of Ser. No. 27,988, April 13, 1970, Pat. No. 3,705,191. This application Dec. 6, 1973, Ser. No. 422,227

Int. Cl.² C07F *9/38*

U.S. Cl. 260—502.4 P 5 Claims

1. An ethane diphosphonate having the formula



wherein X is a halogen and each R_3 is individually selected from the group consisting of hydrogen, alkali metal ions, and ammonium ions.

3,944,600

INDENYLIDENE-3-ACETIC ACID PROCESS FOR PREPARING INDENE ACETIC ACIDS

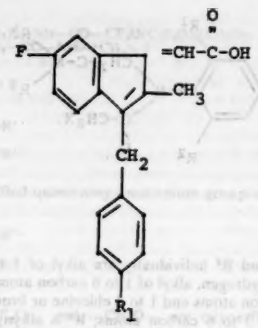
Roger J. Tull, Metuchen; Robert F. Czaja, Scotch Plains; Richard F. Shuman, Westfield, and Seemon H. Pines, Murray Hill, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 426,864, Dec. 20, 1973, Pat. No. 3,870,753, and a continuation-in-part of Ser. No. 486,031, July 5, 1974. This application Sept. 30, 1974, Ser. No. 509,602

Int. Cl.² C07C *147/14*, *149/00*

U.S. Cl. 260—515 A 1 Claim

1. A cis and trans compound of the formula:



wherein

R_1 is methylthio or methylsulfinyl.

3,944,601

QUALITY OF PHTHALIC ACIDS IMPROVED BY STRONG INORGANIC ACIDS

George E. Kuhlmann, Downers Grove, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Dec. 20, 1972, Ser. No. 316,858

Int. Cl.² C07C *51/33, 63/26*

U.S. Cl. 260—524 R 5 Claims

1. A method of producing a phthalic acid of improved quality from the oxidation of a xylene with molecular oxygen in an oxidation zone in the presence of a liquid phase acetic acid solution of a system of catalysis comprising a combination based on xylene of 0.1 to 112 weight percent heavy metal oxidation catalyst and from 0.01 to 116 weight percent bromine in said zone, which method consists essentially having in said liquid phase acetic acid solution the inorganic acid hydrobromic acid, sulfuric acid or phosphoric acid in an amount of from 0.1 to 1.9 equivalents thereof per equivalent of catalyst metal in addition to acidic bromine in said catalysis combination.

3,944,602

PROCESS FOR THE PREPARATION OF TEREPHTHALIC ACID

Ewald Katzschmann, Witten-Bommern, Germany, assignor to Chemische Werke Witten GmbH, Germany

Continuation of Ser. No. 568,405, July 28, 1966, abandoned. This application Sept. 7, 1971, Ser. No. 178,475

Claims priority, application Germany, July 28, 1965, 1259326

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C07C *63/26, 51/42*

U.S. Cl. 260—525 16 Claims

1. An after-treatment process for oxidation products, that are obtained by the air oxidation of a mixture of p-toluic acid methyl ester in excess and p-xylene and that contain p-toluic acid methyl ester, p-toluic acid, terephthalic acid monomethyl ester and terephthalic acid, to isolate pure terphthalic acid which comprises heating said oxidation products to an elevated temperature and under pressure and adding a substance selected from the group consisting of water, a mixture of p-xylene and water, and a mixture of acetic acid and water and separating the pure terephthalic acid from the reaction mixture.

3,944,603

PRODUCTION OF PROPIONIC ACID

Donald E. Morris, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 232,256, March 6, 1972, abandoned. This application May 7, 1974, Ser. No. 467,701

Int. Cl.² C07C *51/54*

U.S. Cl. 260—533 AN 10 Claims

1. In a process for production of propionic acid, propionic anhydride and mixtures thereof with the repression of polyketones wherein ethylene is reacted, in the absence of hydrogen, with carbon monoxide and at least one member of the group consisting of water, propionic acid and mixtures thereof, at a temperature of 50° to 300°C, the improvement which comprises contacting the said reactants in the presence of a catalyst system consisting essentially of an iridium complex containing at least one ligand selected from the group consisting of

a tertiary organophosphorus compound of 3 to 90 carbon atoms,

a tertiary organoarsenic compound of 3 to 90 carbon atoms,

a tertiary organ oantimony compound of 3 to 90 carbon atoms,

an olefinic compound of 2 to 40 carbon atoms,

and an organo-diolefinic compound of 2 to 40 carbon atoms in the substantial absence of added halide components.

3,944,604

PRODUCTION OF PROPIONIC ACID

Arnold Hershman, Creve Coeur, and Denis Forster, University City, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 21, 1973, Ser. No. 390,268

Int. Cl.² C07C *51/14*

U.S. Cl. 260—533 A 10 Claims

1. A one step, low-pressure process for the preparation of propionic acid which comprises reacting ethylene with carbon monoxide and water at a temperature of 50°C to 300°C and a partial pressure of carbon monoxide of from 1 to 1500 psia in the presence of

1. a cobalt component;

2. an iodide component

wherein the range of atomic ratios of said iodide to cobalt is from 2.1:1 to 35:1.

3,944,605

METHOD OF RECOVERING UNREACTED AMMONIUM CARBAMATE IN UREA SYNTHESIS

Shigeru Inoue, and Tetsuo Kimura, both of Kamakura, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Jan. 28, 1974, Ser. No. 437,360

Claims priority, application Japan, Feb. 14, 1973, 48-17518

Int. Cl.² C07C *126/00*

U.S. Cl. 260—555 A 5 Claims

1. In a process for recovering unreacted ammonium carbamate contained in the effluent obtained by reacting at urea synthesis temperatures and pressures carbon dioxide with ammonia in stoichiometric excess, wherein said effluent is subjected to a first ammonium carbamate decomposition stage at a gauge pressure of from 40 to 120 kg/cm², then to a second ammonium carbamate decomposition stage at a gauge pressure of from 10 to 25 kg/cm² and finally to a third ammonium carbamate decomposition stage at a gauge pressure of below 5 kg/cm², thereby forming an off-gas in each stage and wherein the off-gases from at least said first and second stages are absorbed in an absorbent selected from the group consisting of water, aqueous ammonia, aqueous urea, aqueous ammonium carbamate and an aqueous solution containing urea and ammonium carbamate, the resultant recovered ammonium carbamate solution being recirculated to the urea synthesis, the improvement which comprises absorbing said off-gas from said second decomposition stage in said absorbent to form an ammonium carbamate containing absorbate and

unabsorbed gaseous ammonia; cooling said unabsorbed gaseous ammonia, to form recovered liquid ammonia; absorbing in said ammonium carbamate containing absorbate pressurized to the pressure substantially equal to that of said first decomposition stage substantially all of said-off-gas from said decomposition stage at a temperature of from 120°to 180°C while removing the heat of absorption by indirect heat exchange with a mixture of make-up liquid ammonia and said recovered liquid ammonia pressurized to said urea synthesis pressure, whereby said recovered ammonium carbamate solution is formed and said mixture of said make-up liquid ammonia and said recovered liquid ammonia are heated to a temperature of from 100° to 160°C; reacting said mixture of said make-up liquid ammonia and said recovered liquid ammonia and said recovered ammonium carbamate solution with make-up carbon dioxide in a heat recovery zone to form a reaction mixture containing ammonium carbamate while concurrently removing from said zone the surplus heat of reaction by indirect heat exchange; and introducing said formed reaction mixture containing ammonium carbamate to the urea synthesis.

3,944,606

PROCESS OF PRODUCING ALKALI METAL OR AMMONIUM CITRATES

Manfred Rieger, Ludwigshafen, and Johannes Kioustelidis, Mannheim, both of Germany, assignors to Joh. A. Benckiser GmbH, Ludwigshafen, Germany

Filed Oct. 29, 1974, Ser. No. 518,714

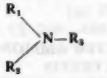
Claims priority, application Germany, Nov. 3, 1973, 2355059

Int. Cl.² C07C *59/16*

U.S. Cl. 260—535 P **13 Claims**

1. In a process of producing alkali metal or ammonium citrates from citric acid solutions produced chemically or by fermentation, by extraction, the steps which comprise

a. extracting the starting citric acid solution by means of a water-immiscible solvent mixture of an amine of the formula



in which

R_1 and R_2 are alkyl radicals with 7 to 15 carbon atoms and

R_3 is hydrogen or an alkyl radical with 1 to 15 carbon atoms, and

an organic solvent as extracting agent and

b. subsequently re-extracting the resulting organic solvent extract with a compound forming alkali metal or ammonium salts of citric acid.

3,944,607

HERBICIDAL N-(N'-ALKYNYLCARBAMYLMETHYL)-2,6-DIALKYL-α-ALOACETANILIDES

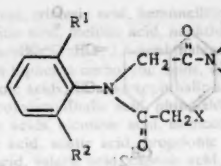
David Cheong King Chan, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 17, 1974, Ser. No. 515,781

Int. Cl.² A01N *9/20*; C07C *103/28*

U.S. Cl. 260—558 A **9 Claims**

1. A compound of the formula



wherein R^1 and R^2 individually are alkyl of 1 to 6 carbon atoms; R^3 is hydrogen, alkyl of 1 to 6 carbon atoms, haloalkyl of 1 to 2 carbon atoms and 1 to 4 chlorine or bromine atoms, or alkynyl of 3 to 6 carbon atoms; R^4 is alkynyl of 3 to 6 carbon atoms; and X is fluorine, chlorine, bromine or iodine.

3,944,608

SYNTHESIS OF N-[1-(CHLOROMETHYL)PROPYL]ACETAMIDE

Balwant Singh, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 1, 1974, Ser. No. 493,800

Int. Cl.² C07C *103/34*

U.S. Cl. 260—561 HL **6 Claims**

1. A process for the synthesis of N-[1-(chloromethyl)-propyl]acetamide which comprises reacting N-[1-(chloromethyl)propyl]acetimidoyl chloride with water, in the presence of at least about a molar equivalent of a weak base selected from the group consisting of calcium carbonate, calcium oxide, calcium hydroxide, sodium carbonate, sodium bicarbonate, potassium carbonate, potassium bicarbonate, barium carbonate, and strontium carbonate, thereby hydrolyzing N-[1-(chloromethyl)propyl]acetimidoyl chloride to N-[1-(chloromethyl)propyl]acetamide.

3,944,609

CATALYST PREPARATION METHOD

John Allan Fetchin, and William Frank Marzluff, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 366,223, June 1, 1973, abandoned. This application Apr. 17, 1975, Ser. No. 569,327

Int. Cl.² C07C *103/08*

U.S. Cl. 260—561 N **4 Claims**

1. A process comprising catalytic conversion of acrylonitrile to acrylamide by hydration of the nitrile with water in contact with solid heterogeneous catalyst prepared by reduction of copper and iron from aqueous solution of soluble copper and iron compounds wherein the active catalyst components of said catalyst consist essentially of reduced copper and reduced iron with about 0.2 to about 4 percent by weight of the combined dry weight of the reduced copper and iron being reduced iron.

3,944,610

N,N-BIS-AMINOALKYLAMIDES OF POLYOXAPERFLUOROALKANDIOIC ACIDS, DERIVATIVES THEREOF AND PROCESS FOR PREPARING SAME

Gerardo Caporiccio, and Giuliano Carniselli, both of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Dec. 23, 1974, Ser. No. 536,951

Claims priority, application Italy, Dec. 28, 1973, 32358/73

Int. Cl.² C07C *103/30*

U.S. Cl. 260—561 HL **10 Claims**

1. Surface active agents having anti-corrosion or oil-repellent properties, the chain of which, having the structure of bis-alkyl-amides of polyoxaperfluoroalkandioic acids, corresponds to the general formula:

$$Z-(CH_2)_x-NH-CO-CF_2O(C_2F_4O)_l(CF_2O)_n-CF_2-CO-NH-(CH_2)_x-Z$$

wherein Z is a

group, a salified quaternary ammonium group or a

group, $-C_2F_4O-$ and $-CF_2O-$ are oxyperfluoroalkylene units distributed randomly along the chain, l and n are integers the sum of which is from 2 to 50 inclusive and the l/n ratio is from 0.2 to 1.5, inclusive, p is an integer from 1 to 20, inclusive, R′ and R″ are alkyl radicals either the same or different and having from 1 to 6 carbon atoms or form, together with the adjacent nitrogen atom, a ring with 5 or 6 atoms, the remaining atoms of the ring consisting of atoms of carbon or of carbon and one oxygen atom, and O is an oxygen atom.

3,944,611

NITROGEN-CONTAINING COMPOUNDS

Leslie Harold Smith, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

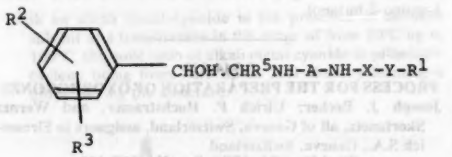
Filed June 13, 1974, Ser. No. 479,174

Claims priority, application United Kingdom, June 22, 1973, 29679/73

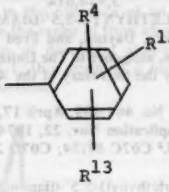
Int. Cl.² C07C *103/50*

U.S. Cl. 260—562 R **7 Claims**

1. An ethanolamine derivative selected from the group consisting of compounds of the formula:



wherein A is alkylene of from 2 to 6 carbon atoms, wherein R^1 is hydrogen or alkyl, alkenyl, halogenoalkyl or cycloalkyl each of up to 6 carbon atoms, or aryl of the formula:



wherein R^2, R^3, R^{12}, and R^{13}, which may be the same or different, each is hydrogen, halogen, nitro, amino or cyano, or alkyl alkenyl, alkoxy, alkenyloxy, hydroxalkyl, alkanoyl, acylamino each of up to 6 carbon atoms, wherein R_4 is hydrogen, hydroxy or carbamoyl, wherein R^5 is hydrogen or alkyl of up to 6 carbon atoms, wherein X is carbonyl and wherein Y is a direct link, or alkylene or alkyleneoxy each of up to 6 carbon atoms, or (except when R^1 is hydrogen) oxygen, and the acid-addition salts thereof.

3,944,612

4-FLUORO-3-NITRO ANILINES

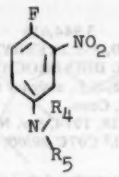
Milos S. Bil, Forest Hills, N.Y., assignor to Clairol Incorporated, New York, N.Y.

Division of Ser. Nos. 683,758, Nov. 2, 1970, abandoned, and Ser. No. 719,682, April 8, 1968, Pat. No. 3,632,582. This application Nov. 27, 1970, Ser. No. 93,465

Int. Cl.² C09B *87/60, 91/06*

U.S. Cl. 260—573 **3 Claims**

1. Compounds of formula



wherein R_4 and R_5 are selected from the group consisting of mono-, di-, or trihydroxyalkyl having 1 to 6 carbon atoms and alkyl having 1 to 6 carbon atoms.

3,944,613

PROCESS FOR PREPARING DIPHENYLAMINE FROM ANILINE

Isao Naramoto; Tatsuo Kyuma, and Giichi Akazome, all of Kyoto, Japan, assignors to New Japan Chemical Company, Limited, Japan

Filed Sept. 6, 1974, Ser. No. 503,700

Claims priority, application Japan, Sept. 10, 1973, 48-102340

Int. Cl.² C07C *87/54*

U.S. Cl. 260—576 **6 Claims**

1. In the process for preparing diphenylamine by reacting aniline in a liquid phase in the presence of a catalyst at a temperature of about 320° to about 370°C, the improvement wherein said catalyst comprises an amorphous synthetic silica-alumina catalyst containing 5 to 50% by weight of alumina.

3,944,614

2,2'-BIS(PHENYLETHYNYL-5,5'-DIAMINOBENZIDINE

Frederick L. Hedberg, Dayton, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 461,689, April 17, 1974, Pat. No. 3,876,614. This application Nov. 22, 1974, Ser. No. 526,192

Int. Cl.² C07C 87/54; C07D 241/42

U.S. Cl. 260—578 1 Claim

1. 2,2'-Bis(phenylethynyl)-5,5'-diaminobenzidine.

3,944,615

PROCESS FOR THE PRODUCTION OF AROMATIC PRIMARY AMINES

Abul F. M. Iqbal, Glattbrugg, Switzerland, assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 246,216, April 21, 1972, abandoned. This application May 23, 1974, Ser. No. 472,762

Claims priority, application Switzerland, Apr. 30, 1971, 6379/71

Int. Cl.² C07C 85/11

U.S. Cl. 260—580 12 Claims

1. In a process for the preparation of aromatic primary amine which comprises reducing an aromatic nitro compound with carbon monoxide and water under reaction conditions, the improvement which comprises conducting the reaction in the presence of a basic nitrogen containing compound selected from the group consisting of a tertiary amine and an amide and a rhodium catalyst selected from the group consisting of rhodium oxide, rhodium hydroxide, a rhodium carbonyl compound and a rhodium salt which forms a rhodium carbonyl compound under reduction conditions.

3,944,616

PURIFICATION OF D,D'-2,2'(ETHYLENEDIIMINO)DI-1-UTANOL DIHYDROCHLORIDE

John Kazan, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 29, 1974, Ser. No. 518,832

Int. Cl.² C07C 89/00, 89/04

U.S. Cl. 260—584 R 4 Claims

1. In a process for preparing d,d'-2,2'-(ethylenediimino)di-1-butanol dihydrochloride comprising the steps of

reacting excess d-2-amino-1-butanol with ethylene dichloride,

adding to the reaction mixture thus formed sufficient finely divided sodium hydroxide to neutralize hydrogen chloride formed therein,

distilling off unreacted d-2-amino-1-butanol, adding sufficient of a 2 to 4 carbon alkanol to the residue to dissolve the thus formed d,d'-2,2'-(ethylenediimino)di-1-butanol, separating sodium chloride therefrom,

adding hydrogen chloride to the resulting solution to form d,d'-2,2'-(ethylenediimino)di-1-butanol dihydrochloride, and separating the same from said alkanol, the improvement which comprises:

reacting a 2 carbon alkanol solution of d,d'-2,2'-(ethylenediimino)di-1-butanol with an essentially stoichiometric amount of hydrogen chloride at 40°–60°C. in the presence of about 7% to 10% by weight water, based on the total weight of the reaction mixture to form d,d'-2,2'-(ethylenediimino)di-1-butanol dihydrochloride,

slowly cooling the resulting aqueous alkanol solution to 0 to −10°C. to precipitate said dihydrochloride,

separating said dihydrochloride from said aqueous alkanol solution,

washing said dihydrochloride with a 2 to 4 carbon alkanol, and drying the same.

3,944,617

SYNTHESIS OF DL-2-AMINO-1-BUTANOL

Balwant Singh, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 1, 1974, Ser. No. 493,801

Int. Cl.² C07C 89/00, 91/04

U.S. Cl. 260—584 R 10 Claims

1. A process for the synthesis of dl-2-amino-1-butanol hydrochloride which comprises heating N-[1-(chloromethyl)-propyl]acetamide in the presence of a lower alkanol and water whereby the N-[1-(chloromethyl)propyl]acetamide is hydrolyzed to dl-2-amino-1butanol hydrochloride, and distilling off the coproduced alkanol acetate, whereby side reactions are suppressed, and the hydrolysis to dl-2-amino-1-butanol hydrochloride is essentially quantitative.

3,944,618

SYNTHESIS OF ETHAMBUTOL

Balwant Singh, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 1, 1974, Ser. No. 493,802

Int. Cl.² C07C 89/00, 89/04, 91/04

U.S. Cl. 260—584 R 9 Claims

1. The process of the synthesis of d,d'-2,2'-(ethylenediimino)di-1-butanol which comprises mixing dl-2-amino-1-butanol containing dl-1-amino-2-butanol with L(+)-tartaric acid in anhydrous methanol, separating the crystalline acid L(+)- tartrate of d-2-amino-1-butanol from the salts of dl-2-amino-1-butanol and d- and l- 1-amino-2-butanol which remain in solution in the methanol, dissolving said d-2-amino-1-butanol L(+)- tartrate in water, adding an alkali or alkaline earth hydroxide, separating out the resultant alkali or alkaline earth L(+)- tartrate, thus isolating d-2-amino-1-butanol, evaporating off remaining water, adding ethylene dichloride, and reacting to form d,d'-2,2'-(ethylenediimino)di-1-butanol, and isolating the thus formed d,d'-2,2'-(ethylenediimino)di-1-butanol as the dihydrochloride salt.

3,944,619

SYNTHESIS OF D-2-AMINO-1-BUTANOL

Balwant Singh, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 1, 1974, Ser. No. 493,792

Int. Cl.² C07C 89/00

U.S. Cl. 260—584 R 14 Claims

1. A process for the isolation of d-2-amino-1-butanol from dl-2-amino-1-butanol containing up to about 10% of dl-1-amino-2-butanol which comprises forming a solution of said dl-2-amino-1-butanol containing dl-1-amino-2-butanol in anhydrous methanol, adding thereto L(+)-tartaric acid in at least about one-half molar quantity, and separating the crystalline acid L(+)-tartrate salt of d-2-amino-1-butanol from the methanol containing 1-2-amino-1-butanol and both d- and l-1-amino-2-butanol.

3,944,620

PROCESS FOR THE PREPARATION OF OXOPHORONES

Joseph J. Becker; Ulrich P. Hochstrasser, and Werner Skorianetz, all of Geneva, Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

Filed Nov. 26, 1974, Ser. No. 527,449

Claims priority, application Switzerland, July 10, 1974, 9479/74

Int. Cl.² C07C 45/00, 45/04

U.S. Cl. 260—586 P 4 Claims

1. Process for the preparation of 2,2,6-trimethyl-cyclohex-5-en-1,4-dione, which comprises oxidizing 3,5,5-trimethyl-cyclohex-2-en-1-one, in the liquid phase, by means of oxygen, or an oxygen containing gas mixture in the presence of a metal catalyst selected from a salt or an oxide of vanadium, chromium, manganese, iron, cobalt, nickel or rhodium or an or-

ganic derivative of vanadium, iron, cobalt or rhodium at a temperature of from about 80° to 180°C.

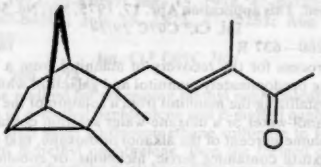
3,944,621

PI-TRICYCLENE DERIVATIVES AND PROCESS FOR PREPARING PI-TRICYCLENE DERIVATIVES

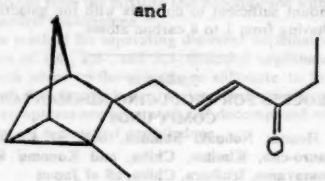
Braja Dulal Mookherjee, Matawan; Venkatesh Kamath, Red Bank, both of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Mar. 10, 1975, Ser. No. 556,862
Int. Cl.² C07C 45/21, 45/00, 49/61
U.S. Cl. 260—586 G 5 Claims

1. A process for preparing a mixture of tricyclic ketones having the structures:

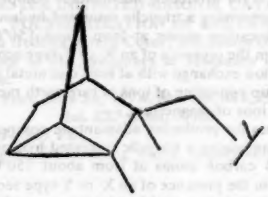


and

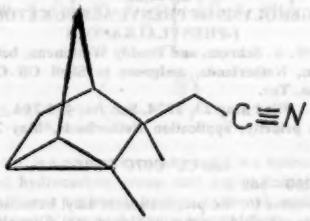


comprising the steps of:

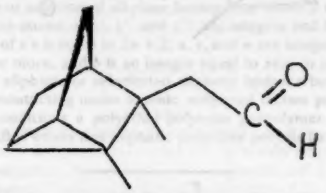
i. Reacting a Pi-halotricyclene having the structure:



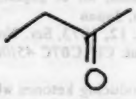
with an alkali metal cyanide in the presence of an inert solvent at a temperature in the range of from 80°C up to 100°C, the mole ratio of alkali metal cyanide to pi-halotricyclene being from 10:1 up to 20:1 thereby forming a nitrile having the structure:



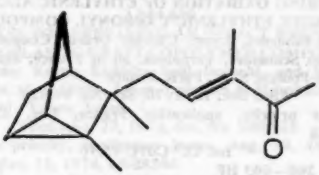
ii. Reacting the thus formed nitrile with diisobutyl aluminum hydride in the presence of an inert solvent, at a temperature in the range of from about 40°C up to 80°C, the mole ratio of diisobutyl aluminum hydride:nitrile being about 1:1, thus forming a nortricycloekasantalal having the structure:



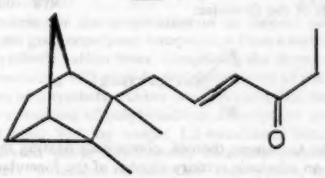
iii. Reacting the thus formed nortricycloekasantalal with butanone having the structure:



in the presence of a base selected from the group consisting of an alkali metal hydroxide and an alkaline earth metal hydroxide at a temperature in the range of from 25°C up to 50°C, the mole ratio of butanone:nortricycloekasantalal being in the range of from 5:1 up to 15:1, the weight of butanone as a percentage of reaction mass being from 5% up to 20%, thus forming a tricyclic-alpha, betaunsaturated ketone mixture of compounds which have the structures:

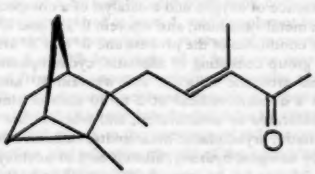


and



wherein Y is halogen selected from the group consisting of bromo, chloro and iodo.

5. A mixture of compounds having the structures:



and

3,944,622

METHOD FOR PRODUCING KETONES

Takehiko Okamoto; Tamihiro Ohashi, both of Ichihara, and Isao Koga, Yokohama, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Sept. 12, 1973, Ser. No. 396,660
Int. Cl.² C07C 45/00
U.S. Cl. 260—593 R 11 Claims

1. A method for producing ketones which comprises reacting an aldehyde selected from the group consisting of straight chain or branched chain aliphatic aldehydes having a carbon atom number of 4 to 10 (inclusive) with a monocarboxylic acid selected from the group consisting of acetic acid and propionic acid in the presence of water and zirconium oxide at a temperature in the range of 200° to 600°C.

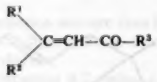
3,944,623

ISOMERING OXIDATION OF ETHYLENIC ALCOHOLS TO GIVE ETHYLENIC CARBONYL COMPOUNDS

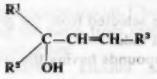
Pierre Chabardes, Lyon; Charles Grard, Chaponost, and Charles Schneider, Vernaison, all of France, assignors to Rhone-Poulenc S. A., Paris, France

Filed Dec. 18, 1970, Ser. No. 99,520
Claims priority, application France, Dec. 23, 1969, 69.44648
Int. Cl.² C07C 45/16
U.S. Cl. 260—603 HF 15 Claims

1. A process for the preparation of ethylenic carbonyl compounds of the formulae:



and the tautomers thereof, comprising heating in the liquid phase an ethylenic tertiary alcohol of the formulae:



in the presence of oxygen and a catalyst of a compound of the transition metal vanadium, and wherein R^1, R^2 and R^3 are inert under the conditions of the process and R^1 and R^2 are selected from the group consisting of aliphatic, cycloaliphatic, arylaliphatic and aromatic radicals, and wherein R^1 and R^2 may represent a divalent radical of 2 to 30 carbon atoms which may be saturated or unsaturated, and wherein the aliphatic, cycloaliphatic, arylaliphatic or aromatic radicals may be substituted by halogen, hydroxy, alkoxy, acyl or acyloxy substituents and R^3 may be the same as R^1 and R^2 or hydrogen.

3,944,624

POLYMERIC PINENE EPOXIDES AND PROCESS FOR PREPARING THE SAME

Erwin Richard Ruckel, Darien, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 24, 1975, Ser. No. 543,762
Int. Cl.² C07C 43/18
U.S. Cl. 260—611 B 10 Claims

1. A homopolymer having a molecular weight ranging between about 780 and 1420 and being selected from the group consisting of poly-α-pinene epoxide and poly-β-pinene epoxide.

3,944,625

SEPARATION OF MANNITOL FROM GALACTITOL

John A. Neal, Bellingham, Wash., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Continuation-in-part of Ser. No. 328,966, Feb. 2, 1973, abandoned. This application Apr. 17, 1975, Ser. No. 569,079
Int. Cl.² C07C 29/24
U.S. Cl. 260—637 R 16 Claims

1. A process for the recovery of mannitol from a mixture containing predominately mannitol and galactitol which comprises crystallizing the mannitol from a solution of the mixture in an alkanol-water or a dioxane-water solution containing at least 1 volume percent of the alkanol or dioxane, said solution of the mixture containing ferric, nickelous, or cobaltous ions in an amount sufficient to complex with the galactitol, said alkanol having from 1 to 4 carbon atoms.

3,944,626

PROCESS FOR PRODUCING ADAMANTANE COMPOUNDS

Kosaku Honna; Nobuaki Shimizu, both of Kammizumi, Sodegauro-cho, Kimitsu, Chiba, and Konomu Kurisaki, Kmazuasayama, Ichihara, Chiba, all of Japan

Filed Apr. 16, 1974, Ser. No. 461,397
Claims priority, application Japan, Apr. 26, 1973, 48-46635; July 30, 1973, 48-84869
Int. Cl.² C07C 5/24
U.S. Cl. 260—666 M 12 Claims

1. A process for producing adamantane compounds which comprises isomerizing a tricyclic saturated hydrocarbon having 10 to 14 carbon atoms at from about 150°C to 300°C temperature in the presence of an X- or Y-type zeolite catalyst subjected to ion exchange with at least one metal ion selected from the group consisting of ions of rare earth metals, ions of calcium and ions of magnesium.

7. A process for producing adamantane compounds which comprises isomerizing a tricyclic saturated hydrocarbon having 10 to 14 carbon atoms at from about 150°C to 300°C temperature in the presence of an X- or Y-type zeolite catalyst subjected to ion exchange with at least one metal ion selected from the group consisting of ions of rare earth metals, ions of calcium, ions of magnesium and further being loaded with 1 to 4 metals selected from the group consisting of germanium, platinum, rhenium, nickel, cobalt, copper, iron, ruthenium and rhodium.

3,944,627

HYDROGENOLYSIS OF PHENYL ALKYL KETONES AND 1-PHENYLALKANOLS

Cornelis W. A. Schram, and Freddy Wattimena, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 23, 1974, Ser. No. 472,764
Claims priority, application Netherlands, May 23, 1973, 7307174
Int. Cl.² C07C 15/04
U.S. Cl. 260—668 R 8 Claims

1. A process for the preparation of alkyl benzenes by contacting phenyl alkyl ketones and/or phenyl alkanols in which

alkanols the alkanol moiety has at least two carbon atoms and the phenyl and hydroxyl groups are attached to the same carbon atom, with hydrogen at a temperature between about 175°C and about 450°C and with a supported noble metal of Group VIII of the Periodic Table of the Elements as a catalyst.

3,944,628

METHOD FOR THE SEPARATION OF HYDROCARBONS

Yoshiaki Suzuki, Machida; Hajime Mori, and Takemi Nakanome, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Apr. 4, 1973, Ser. No. 347,764

Claims priority, application Japan, Apr. 7, 1972, 47-35015; June 8, 1972, 47-57097; June 15, 1972, 47-59727; June 27, 1972, 47-64304; July 13, 1972, 47-70252; Aug. 2, 1972, 47-77399

Int. Cl.² C07C 7/01

U.S. Cl. 260—674 N 2 Claims

1. The method for separating methyl naphthalenes where a mixture of α-methyl naphthalene and β-methyl naphthalene is reacted with silver tri-fluoromethane sulfonate to form complexes of β-methyl naphthalene, then the formed complexes are separated from the mixture and decomposed with water to free β-methyl naphthalene.

2. The method for separating dimethyl naphthalene where a mixture of 1,6-, 2,6-, and 2,3- dimethyl naphthalene is reacted with silver tri-fluoromethane sulfonate to form complexes of 2,6-dimethyl naphthalene selectively, then the formed complexes are separated and decomposed with water to separate 2,6-dimethyl naphthalene.

3,944,629

POLYESTER INITIATED ANIONIC CATALYZED POLYMERIZATION OF LACTAM

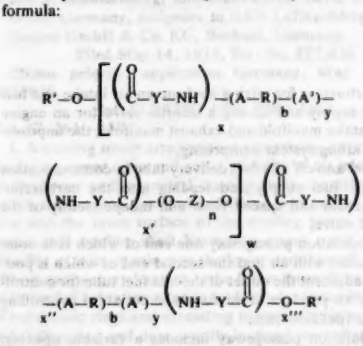
Ross Melvin Hedrick, Creve Coeur, and James D. Gabbert, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed June 24, 1974, Ser. No. 482,532

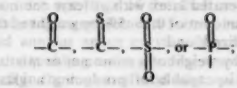
Int. Cl.² C08L 77/02

U.S. Cl. 260—857 PE 15 Claims

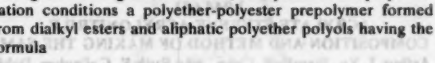
1. A process for forming block terpolymers having the formula:



where $(O\text{-}Z)_n$ is a polymeric moiety and Z is a hydrocarbon or substituted hydrocarbon group said group being alkylene, arylene, alkylene carbonyl, arylene carbonyl, and mixtures thereof; A and A′ are acyl groups selected from



R is a divalent or polyvalent hydrocarbon group; Y is an alkylene or substituted alkylene having from about 3 to about 14 carbon atoms; x, x′, x″ and x‴ are integers and the total number of x's is equal to $2w + 2$; n, y, and w are integers equal to one or more, and b is an integer equal to zero or one; and R′ is an aliphatic or substituted aliphatic hydrocarbon, comprising: contacting under anionic, catalyzed lactam polymerization conditions a polyether-polyester prepolymer formed from dialkyl esters and aliphatic polyether polyols having the formula



with lactams having the formula

where Y, Z, R, R′, A, A′, b, y, n, w, and b are defined above; resulting in the expansion of the polyether-polyester prepolymer through the reactive insertion of the lactams into the ester sites of the prepolymer, said lactams and polyether-polyester prepolymers being the sole components of the block terpolymer.

3,944,630

PROCESS FOR PREPARING AN IMPACT RESISTANT THERMOPLASTIC GRAFT COPOLYMER COMPOSITION

Fumio Ide; Kazuo Kishida; Seiji Deguchi, and Masahiro Kaneda, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1974, Ser. No. 500,925

Claims priority, application Japan, Aug. 30, 1973, 48-96592; Mar. 12, 1974, 49-28356

Int. Cl. C08f 19/06, 19/08, 19/10

U.S. Cl. 260—879 15 Claims

1. A process for the preparation of an impact resistant thermoplastic graft copolymer composition from a small particle sized synthetic rubber latex, comprising the steps of:

1. agglomerating 100 parts by weight in terms of the solids content of a synthetic rubber latex (A) selected from the group consisting of polybutadiene, copolymers containing at least 50% by weight 1,3-butadiene, butadiene-unsaturated nitrile copolymers, butadiene-acrylate copolymers, butadiene-methacrylate copolymers, terpolymers or multipolymers containing at least 50% by weight 1,3-butadiene, polychloroprene, chloroprene copolymer and a homopolymer or copolymer of at least 50% by weight of alkyl acrylate having 1 to 12 carbon atoms in the alkyl group containing small-sized rubber particles by adding 0.1 – 5 parts by weight, in terms of the solids content, of a carboxylic acid containing copolymer latex (B) having a pH of at least 4, said copolymer latex being prepared by polymerizing a mixture of monomers comprising 5 – 20% by weight of at least one monomer selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid and crotonic acid and 95 – 80% by weight of alkyl acrylate having 1 to 12 carbon atoms in the alkyl group, in the presence of at least one anionic emulsifier, and adjusting the pH of the mixed latexes (A) and (B) to not less than 6;

2. stabilizing the agglomerated latex with at least one nonionic emulsifier in an amount of 0.1 – 5% by weight of the dry rubber to be stabilized; and
3. grafting 93 – 30 parts by weight of a monomer or mixture of monomers, which is capable of producing a glassy thermoplastic polymer having a glass transition temperation of not less than 50° C in the presence of or onto 7 – 70 parts by weight in terms of solids content of the agglomerated and stabilized synthetic rubber latex.

3,944,631
ACRYLATE-STYRENE-ACRYLONITRILE COMPOSITION AND METHOD OF MAKING THE SAME

Arthur J. Yu, Stamford, Conn., and Ruth E. Gallagher, Dobbs Ferry, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 1, 1974, Ser. No. 438,918
Int. Cl.² C08L *25/12, 29/06, 31/02, 33/20*
U.S. Cl. 260—881 **28 Claims**

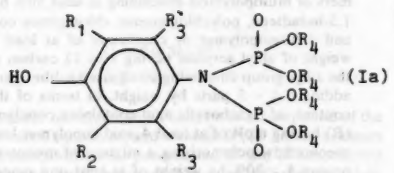
1. A thermoplastic composition having impact and weather resistance which comprises a crosslinked acrylate elastomer, a crosslinked styrene-acrylonitrile copolymer and a linear styrene acrylonitrile copolymer said composition being formed by a process which comprises:
   1. formation of a composition which comprises a crosslinked acrylate elastomer and a crosslinked styrene-acrylonitrile polymer by:
      a i. emulsion polymerization of at least one alkyl acrylate in the presence of at least one crosslinking agent and
      a ii. emulsion polymerization of styrene, acrylonitrile, and at least one crosslinking agent in the presence of the reaction product of 1 a i. or
      b i. emulsion polymerization of styrene and acrylonitrile in the presence of at least one crosslinking agent and
      b ii. emulsion polymerization of at least one alkyl acrylate and at least one crosslinking agent in the presence of the reaction product of 1 b i.; and
   2. either suspension or emulsion polymerization of styrene and acrylonitrile in the absence of a crosslinking agent in the presence of the composition of Step 1.

3,944,632
PHOSPHORIC ACID ANILIDES

Kurt Schwarzenbach, Pfeffingen, and Heimo Brunetti, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 31, 1974, Ser. No. 493,303
Claims priority, application Switzerland, Aug. 10, 1973, 11564/73; Feb. 6, 1974, 1622/74
Int. Cl.² C07F *9/12;* **C08K** *5/53*
U.S. Cl. 260—926 **3 Claims**

1. A compound of the formula Ia



(Ia)

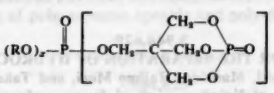
in which R_1 and R_2 independently of one another are a straight-chain or branched alkyl group of 1–5 carbon atoms or cycloalkyl of 6–8 carbon atoms, R_3 and R_3 are hydrogen and R_4 is a straight-chain or branched alkyl group of 1–8 carbon atoms or benzyl.

3,944,633
PHOSPHATE ESTERS

John T. Gresham, Somerset, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 422,841, Dec. 7, 1973, Pat. No. 3,883,478. This application Oct. 31, 1974, Ser. No. 519,434
Int. Cl.² C07F *9/15*
U.S. Cl. 260—927 R **4 Claims**

1. A compound of the formula

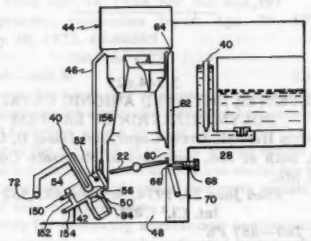


where R is an aryl radical selected from the group consisting of phenyl and naphthyl radicals and phenyl and naphthyl radicals containing one to three chlorine or bromine atoms and substituted derivatives of said radicals, the substituents being selected from the group consisting of methyl, methoxy, phenyl, phenoxy and phenyl and phenoxy containing 1 to 5 chlorine or bromine atoms and y is a integer, 1 to 1, and x is $3 - y$.

3,944,634
CARBURETOR IDLING SYSTEM

Charles R. Gerlach, San Antonio, Tex., assignor to John M. Anderson, Corpus Christi, Tex.

Filed May 29, 1973, Ser. No. 364,491
Int. Cl.² F02M *11/00*
U.S. Cl. 261—41 D **7 Claims**



1. In a carburetor for mixing air from an air intake and fuel from a fuel supply and having a throttle valve for an engine having an intake manifold and exhaust manifold, the improvement in an idling system comprising,
   an idle fuel and off idle fuel delivery tube in communication with the fuel supply and leading into the carburetor downstream and spaced from and independently of the throttle valve,
   an air modulation passageway one end of which is in communication with air and the second end of which is positioned adjacent the outlet of the idle fuel tube for controlling the air pressure at the fuel tube outlet for controlling the idle fuel flow rate,
   said modulation passageway includes a variable opening, and
   the modulation passageway includes a modulation slot opening into the passageway and positioned adjacent and coacts with the throttle valve.

3,944,635

APPARATUS FOR HUMIDIFYING A GAS

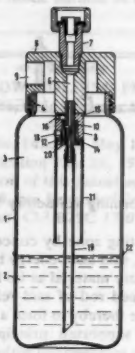
Peter Siegenthaler, Niederscherli, Switzerland, assignor to Carba Limited, Bern, Switzerland

Filed Apr. 16, 1975, Ser. No. 568,578

Claims priority, application Switzerland, Apr. 19, 1974, 5417/74

Int. Cl.² A61M 11/02, 11/06, 15/00

U.S. Cl. 261—62 4 Claims



1. An apparatus for humidifying a gas, which apparatus comprises a container for the humidifying liquid and a supply duct, entering the said container, for the gas which is to be humidified, wherein the gas supply duct terminates in the container in a mist-producing element which comprises a core piece, an elastic jacket which lies tightly against the peripheral surface of the latter, and a sleeve surrounding the jacket, the supply duct entering the core piece and opening into a longitudinal groove on the peripheral surface of the core piece, which groove leads out into the container at one end of the jacket, while in the middle portion of its length a liquid suction duct entering the core piece from the liquid-containing region of the container opens transversely into the groove, and in the sleeve there is disposed opposite the groove an adjusting screw by means of which the cross-section of the groove for the passage of the gas can be adjusted, with the aid of the jacket, just before the opening of the liquid suction duct.

3,944,636

COOLING TOWER

Franz J. Schuldenberg, and Hans-Bernd Gerz, both of Bochum, Germany, assignors to GEA Luftkuehlergesellschaft Happel GmbH & Co. KG, Bochum, Germany

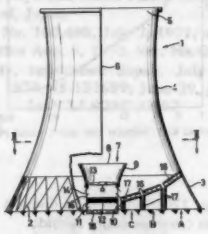
Filed May 14, 1975, Ser. No. 577,426

Claims priority, application Germany, May 17, 1974, 2424059

Int. Cl.² F28C 1/06; F28D 5/00

U.S. Cl. 261—159 11 Claims

1. A cooling tower arrangement comprising a cooling tower having an upper open end and a plurality of air inlet openings at the lower end; a central cooling shaft coaxially arranged within the cooling tower and defining between its outer surface and the inner surface of the cooling tower an annular space, said cooling shaft having an upper open end and a plurality of inlet openings at the lower end thereof; a plurality of heat-exchanger elements to be flown through by a medium to be cooled being arranged in said annular space in a plurality of concentric rings and extending in each ring in substantially radial direction and downwardly inclined toward said central shaft with the radially outermost ends of the heat-exchanger elements in the outermost ring located above said air inlet openings in the tower and with the radially innermost ends of the heat-exchanger elements of the innermost ring located at the inlet openings of the shaft so that the plurality of said heat-exchanger elements form a bowl-shaped arrangement in said annular space curving downwardly towards said shaft; and a trickling unit extending transverse through said central shaft in the region of said inlet openings therein over which a



medium to be cooled is adapted to flow in downward direction so that cooling air will flow in one stream countercurrently to the flow of the medium to be cooled over said trickling unit and in an outer stream parallel to said one stream over said heat-exchanger elements.

3,944,637

INCREASING THE YIELD OF CAST PLASTIC LENSES

Herbert M. Bond, Stillwater, and Daniel L. Torgersen, St. Paul, both of Minn., assignors to Buckbee-Mears Company, St. Paul, Minn.

Filed Feb. 11, 1974, Ser. No. 441,645

Int. Cl.² B29D 11/00

U.S. Cl. 264—1 4 Claims

1. In the process of preparing a polymerized lens in a glass mold by preparing a reactant mixture of methyl methacrylate, diethylene glycol bis (allyl carbonate) and an acid selected from the group consisting of acrylic acid and methacrylic acid, which method comprises: preparing a monomer mixture of methyl methacrylate and diethylene glycol bis (allyl carbonate) wherein the methyl methacrylate monomer ranges from about 10 to about 50% by weight of the monomer mixture, balance diethylene glycol bis (allyl carbonate); adding to said monomer mixture a lubricant and a catalyst of benzoyl peroxide ranging from between about 1 to 1.5% by weight of the monomer mixture; exposing said reactant mixture to a thermal treating zone to polymerize said reactant mixture and form a terpolymer therefrom with the improvement comprising adding to said monomer mixture an acid selected from the group consisting of acrylic acid and methacrylic acid, with said acid ranging from between about ½ to 5% by weight of said monomer mixutre.

3,944,638

PROCESS FOR PREPARING METAL-CARBIDE-CONTAINING MICROSPHERES FROM METAL-LOADED RESIN BEADS

Ronald L. Beatty, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development, Washington, D.C.

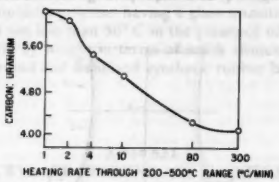
Filed June 18, 1974, Ser. No. 480,323

Int. Cl.² G21C 21/00

U.S. Cl. 264—.5 4 Claims

1. In a method of converting a metal contained in a charge of weak-acid resin microspheres into its corresponding carbide, the improvement which comprises heating said metal-loaded resin charge in an inert atmosphere at a temperature in the range 200°–500°C at a rate which results in carbonizing the resin to create a metal-loaded carbonized microsphere within a carbon matrix, said carbonized microsphere having a

carbon to metal ratio of no less than about 6 and then heating the carbonized microspheres to a carbide-forming temperature in the range 1200°–2000°C to convert the metal within said matrix to its corresponding carbide.

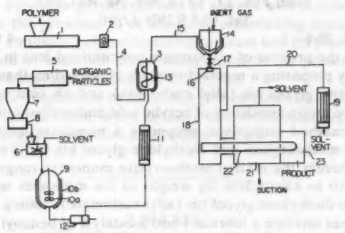


3,944,639

PROCESS FOR CONTINUOUSLY PRODUCING COMPOSITE POROUS FLAKES

Yoshihiro Osajima; Syoji Imao; Tokuo Shinomiya; Sirou Mihara, all of Otake, and Michisuke Edamatsu, Yamaguchi, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 427,843
Claims priority, application Japan, Dec. 29, 1972, 47-1568
Int. Cl.² B01J *2/02*
U.S. Cl. 264—13 **9 Claims**



1. In a process for producing composite porous flakes by spray drying, the improvement which comprises the steps of continuously:

a. forming a polymer melt containing 10 to 75 parts by weight of a thermoplastic polymer,

b. forming a first uniformly dispersed slurry containing 25 to 90 parts of inorganic particles dispersed in an organic solvent for the polymer, said solvent having a boiling point lower than the softening point of the polymer and said particles having a maximum size of 500 μ,

c. prior to mixing the slurry and polymer together, heating said slurry to an elevated temperature, sufficiently high to dissolve the polymer when added,

d. mixing the polymer melt and the heated slurry to form a resulting second uniformly dispersed slurry containing completely dissolved polymer, inorganic particles and organic solvent, and maintaining said second slurry at a predetermined temperature within a variation of ± 5°C,

e. spurting the second slurry as finely dispersed particles into an evaporation zone whereby the solvent is evaporated from the particles to form finely divided, separate flakes, said flakes comprising the polymer having uniformly dispersed therein the inorganic particles and

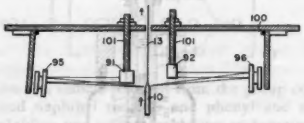
f. recovering the resulting product as porous flakes.

3,944,640

METHOD FOR FORMING REFRACTORY FIBERS BY LASER ENERGY

John S. Haggerty, Lincoln; Wilson P. Menashi, Lexington, and Joseph F. Wenckus, Needham, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Continuation of Ser. No. 68,810, Sept. 2, 1970, abandoned. This application June 14, 1973, Ser. No. 369,884
Int. Cl.² B29B *3/02*
U.S. Cl. 264—25 **9 Claims**



1. A method of forming refractory fibers comprising the steps of

a. providing a heating zone by concentrating laser energy within said zone, said laser energy being of a character to melt the refractory material to be fiberized;

b. introducing a feed rod of said refractory material into said heating zone thereby to form a stable melt volume of said refractory supported principally through surface tension forces on said feed rod within said heating zone;

c. drawing a fiber from said melt volume, said drawing of said fiber being so controlled so that the product of fiber fractional density, drawing velocity and cross sectional area is maintained equal to the product of feed rod fractional density, the velocity at which said rod is introduced into said heating zone and cross sectional area of said rod, and the ratio of the radius of said feed rod to the radius of said fiber and the ratio of the height of said melt volume to the radius of said fiber is such as to retain a high degree of stability; and

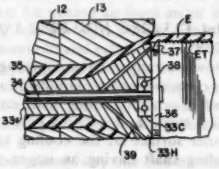
d. controlling the length of said heating zone so that it is no greater than the length of said melt volume.

3,944,641

PROCESS OF FORMING AN IRREGULAR SURFACE ON THE INSIDE OF A TUBE OR PIPE

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 68,724, Sept. 1, 1970, Pat. No. 3,708,253, which is a continuation-in-part of Ser. No. 142,405, Oct. 2, 1961, Pat. No. 3,422,648. This application Jan. 2, 1973, Ser. No. 319,985
The portion of the term of this patent subsequent to Jan. 28, 1988, has been disclaimed.
Int. Cl.² B29D *23/04*
U.S. Cl. 264—70 **5 Claims**



1. A method of providing a plurality of irregular discrete formations along the inside surface of a tube comprising the steps of:

forming tubing on a continuous basis in an extrusion die by causing an extrudate to pass over tooling including a die mandrel which engages the inside surface of said tubing immediately after it is formed in said die, and

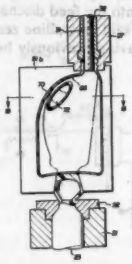
operating said tooling to cause said mandrel to longitudinally move back and forth within said die to variably engage the inside surface of said tubing while the material thereof is in an easily formable condition so as to variably work the inside surface stratum of the wall of the tubing and to form a plurality of parallel circular nonconnected irregular formations therein which formations are composed of elongated cavities and ridges wherein the cavities are in the range of about .0001 to .010 deep and extend along the inside surface of the tubing.

3,944,642

METHOD FOR BLOW MOLDING PLASTIC ARTICLES

Albert R. Uhlig, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 143,802, May 17, 1971, Pat. No. 3,740,181. This application Jan. 26, 1973, Ser. No. 326,926
The portion of the term of this patent subsequent to Dec. 25, 1990, has been disclaimed.
Int. Cl.² B29C 17/07
U.S. Cl. 264—89 8 Claims



7. In a method of reducing scrap and flash in the formation of a container having a seamless blown container body with an asymmetric configuration and an injection molded finish integral with said body, the method including:

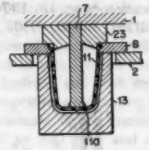
1. closing the sections of a sectional pre-form mold onto a thermoplastic parison having an injection molded finish, and forming a tail portion on said parison, said pre-form mold sections, when closed, defining a first mold cavity;
2. expanding the parison within said first mold cavity to the configuration of a blowable pre-form body having a shape and size intermediate the shape and size of the parison and the container, said pre-form body including an enlarged bulbous region destined to form a portion of the asymmetric configuration of said container;
3. removing the pre-form from the first mold cavity and positioning the pre-form between the sections of a sectional final mold which, when closed, defines a second mold cavity larger than said first mold cavity and conforming to the shape of the blow container body;
4. closing said mold sections to engage the tail portion projecting outside of the mold cavity, the remainder of the pre-form body being confined within the second mold cavity to reduce the formation of flash and scrap material; and
5. expanding said pre-form to the shape of said second mold cavity.

3,944,643

METHOD FOR MANUFACTURING SHAPED ARTICLES BY INJECTION-BLOW MOLDING

Wasuke Sato, Machida; Fumio Iriko, Tokyo; Yoshihiko Yuzawa, Yokohama; Setsuyuki Takeuchi, Ueda, and Nobukuni Ibe, Nagano, all of Japan, assignors to Showa Denko K.K., Tokyo and Nissei Plastic Industrial Co., Ltd., Nagano, both of, Japan

Division of Ser. No. 160,480, July 7, 1971, abandoned. This application Aug. 9, 1973, Ser. No. 387,164
Claims priority, application Japan, July 10, 1970, 45-59881; Dec. 30, 1970, 45-122689; June 29, 1971, 46-47782
Int. Cl.² B29C 17/07
U.S. Cl. 264—97 3 Claims



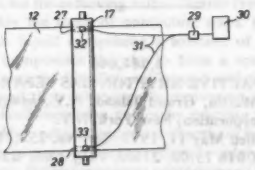
1. A method for manufacturing shaped articles by injection blow molding comprising injection-molding a thermo-plastic material onto the surface of an injection molding core to form a bottomed parison; cooling the parison to a temperature at which it is easily removed from said core; removing the cooled parison from said core and transferring the cooled parison to a reheating mold; reheating the removed parison to a predetermined temperature; transferring the reheated parison to a blow molding mold; stretching longitudinally the reheated parison disposed within the blow-molding mold by extending a stretching rod downwards within the parison; and blow-molding said parison; characterized in that said reheating is performed in a manner that the stretching rod is disposed in contact with the inside bottom of the parison, so that the stretching rod is heated to much the same temperature as the parison and so that in the stretching step, the parison portion contacted with the stretching rod is prevented from being destroyed.

3,944,644

PROCESS FOR PRODUCING POLYMERIC FILM

Jan Baptist Van Cappellen, Berchem, and Walter Johannes Rens, Kontich, both of Belgium, assignors to AGFA-Gevaert, Mortsel, Belgium

Filed Jan. 9, 1974, Ser. No. 432,034
Claims priority, application United Kingdom, Jan. 10, 1973, 1413/73
Int. Cl.² B29C 25/00; B29D 7/24
U.S. Cl. 264—146 9 Claims



1. In a process for producing polymeric film, wherein a polymeric film, while it is at a temperature at which it is readily deformable, is longitudinally stretched in a zone where the film is unsupported by drawing the film away from said zone at a speed which is greater than the speed at which the film is fed into such zone, the improvement of supplying a

heat-transfer liquid between the film and a cooling roller onto which the film is recieved at the end of its travel through said zone, and wherein the heat-transfer liquid is supplied between marginal portions only of the film and the corresponding peripheral portions of said cooling roller thereby to reduce and stabilise the necking-in of the film on said cooling roller.

3,944,645

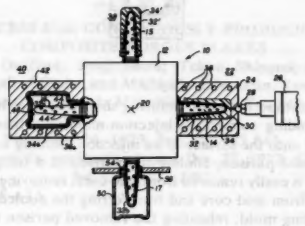
METHOD FOR BALLOON BLOWN PLASTIC MOLDING

John J. Farrell, Green Brook, N.J., assignor to Farrell Patent Company, Greenbrook, N.J.

Division of Ser. No. 246,878, April 24, 1972, Pat. No. 3,816,046. This application Mar. 18, 1974, Ser. No. 452,426

Int. Cl.[2] B29C *17/06, 17/07, 25/00*

U.S. Cl. 264—237 10 Claims



1. A method for injection blow molding a biaxially oriented hollow plastic article comprising:

providing a core rod with a deflated balloon surrounding the core rod, and maintaining a fluid tight seal between the core rod and balloon adjacent the neck portion of the parison, injection molding plastic material onto the exterior surface of the balloon to form a parison; conditioning the parison to a temperature low enough to permit orientation; inflating the core rod supported balloon in a blow mold so as to stretch the parison both circumfrentially and axially to take the shape of the blow mold so as to form a biaxially oriented article; providing a clearance between the expanded balloon and the core rod adjacent the neck portion of the blown article for permitting the balloon to collapse; and collapsing the balloon by drawing vacuum on the balloon through the core rod to provide a clearance between the balloon and the inside surface of the blown article, and permitting air to enter this clearance so as to collapse the balloon.

3,944,646

RADIOACTIVE KRYPTON GAS SEPARATION

Jay Robert Martin, Grand Island, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 11, 1972, Ser. No. 252,219

Int. Cl. C01b *13/00, 21/00;* F25j *3/00;* G21c *19/20*

U.S. Cl. 423—219 16 Claims

1. A method for the separation of radioactive krypton from a feed gas mixture comprising nitrogen and trace amounts of carbon dioxide and said radioactive krypton, comprising the steps of:

a. providing said feed gas mixture at superatmospheric pressure and ambient temperature and passing same from the feed inlet end through the first of at least two crystalline zeolite molecular sieve adsorption zones for preferential adsorption of carbon dioxide, and coadsorption of a minor part of said krypton;

b. discharging non-adsorbed prepurified gas from the feed discharge end of said first adsorption zone of (a) and cooling same to cryogenic temperature;

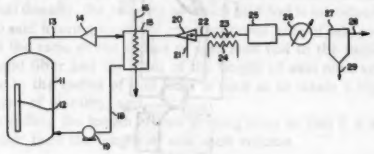
c. distilling the cryogenically cooled prepurified gas from (b) against nitrogen liquid to produce a krypton bottoms concentrate liquid and purified nitrogen overhead gas;

d. partially rewarming said purified nitrogen overhead gas of (c) to about ambient temperature by heat exchange with said nonadsorbed prepurified gas for said cooling of (b);

e. passing a first part of said partially rewarmed purified nitrogen overhead gas as cool purge gas at low pressure into the feed discharge end and through the second of said crystalline zeolite molecular sieve adsorption zones having previously been at least partially loaded with carbon dioxide and krypton by passage of said feed gas mixture therethrough, thereby desorbing substantially all of said krypton and only a minor part of said carbon dioxide from such second zone and discharging the krypton-containing first part of cool purge gas from the feed inlet end of said second zone;

f. joining said first part of purge gas from (e) with said feed gas mixture for said passing through the first zone of (a);

g. further warming to at least 350°F. a second part of said rewarmed purified nitrogen overhead gas as hot purge gas and passing same into the feed discharge end and through an other-than-first said crystalline zeolite molecular sieve adsorption zone having previously been at least partially



loaded with carbon dioxide and coadsorbed krypton by passage of said feed gas mixture therethrough and thereafter only completely desorbed of said krypton by passage of said first part of purge gas therethrough, thereby desorbing carbon dioxide from such other-than-first zone and discharging the carbon dioxide-containing second part of hot purge gas from the feed inlet end of said other-than-first zone; and

h. passing a third part of said partially rewarmed purified nitrogen overhead gas into the feed discharge end and through said other-than-first adsorption zone after the hot purge gas flow for recooling of such zone.

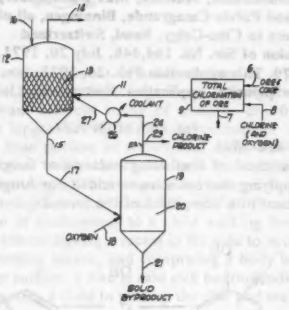
14. A method according to claim 1 wherein said feed gas mixture also contains hydrocarbons, nitrogen oxides and oxygen impurities, and prior to the prepurification of (a) said impurities are removed by the steps of first catalytically reacting the hydrocarbons with part of said oxygen to form water and carbon dioxide and yield a hydrocarbon-depleted gas mixture, adding diverted impurity-depleted gas mixture to said hydrocarbon-depleted gas mixture thereby forming an augmented mixture, adding a stoichiometric excess of hydrogen to the augmented mixture and second catalytically reacting the oxygen and nitrogen oxides content with said hydrogen to form impurity-depleted gas mixture, cooling said impurity-depleted gas mixture and diverting at least 85% by volume thereof, heat exchanging the cooled diverted impurity-depleted feed gas mixture with said impurity-depleted gas mixture for at least part of said cooling thereof, employing the so-rewarmed diverted gas for said adding to said hydrocarbon-depleted gas mixture, and passing the undiverted cooled impurity-depleted gas mixture to said prepurification.

3,944,647

RECOVERING CHLORINE FROM THE CHLORINATION OF TITANIFEROUS MATERIAL

James Paul Bonsack, Aberdeen, Md., assignor to SCM Corporation, New York, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,579
Int. Cl.² C01G 23/02, 49/00; C01B 7/03; C01D 3/04
U.S. Cl. 423—72 3 Claims



1. In a process for chlorination of titaniferous material with chlorine gas with the resulting generation of a feed vapor laden with titanium tetrachloride and ferric chloride, the improvement which comprises:

contacting said feed vapor with sodium chloride in a complexing zone under conditions for converting said ferric chloride therein into liquid ferric chloride salt complex while permitting said titanium tetrachloride to remain as vapor residue;

withdrawing said liquid salt complex from said complexing zone;

atomizing withdrawn salt complex;

intimately mixing the resulting atomizate with molecular oxygen in a substantially empty salt complex oxidation zone at temperature between about 400° and about 750° C. for average residence time of about 0.5 to 20 seconds, thereby converting said atomized salt complex into recovered chlorine gas, solid iron oxide and sodium chloride byproduct;

withdrawing said byproduct from said salt complex oxidizing zone;

withdrawing a stream of recovered chlorine gas from said salt complex oxidizing zone; and

contacting said withdrawn stream of recovered chlorine gas with sodium chloride in a complexing zone under conditions for converting the ferric chloride therein into liquid ferric chloride salt complex while permitting chlorine gas to remain as a gas residue, and removing said gas residue from said complexing zone.

3,944,648

METHOD FOR PROCESSING BAUXITES

Karoly Solymar; Janos Zambo; Marika Orban nee Kelemen; Erno Bujdoso; Ivan Feher; Zoltan Ozvald; Istvan Voros; Tibor Ferenczi; Pal Toth, all of Budapest; Ferenc Lazar, Tatabanya; Tihamer Pinter, Budapest; Gyorgy Sigmond, Budapest; Peter Siklosi, Budapest; Kalman Wentzely, Almasfuzito; Laszlo Lengyel, Almasfuzito, and Jozsef Matyasi, Almasfuzito, all of Hungary, assignors to Aluterv Aluminiumipari Tervezo Vallalat; Femipari Kutato Intezet, both of Budapest and Almasfuzitoi Timfoldgyar, Almasfuzito, all of, Hungary

Filed July 3, 1974, Ser. No. 485,570
Claims priority, application Hungary, July 7, 1973, AU 308
Int. Cl.² C01F 7/06
U.S. Cl. 423—121 7 Claims

1. A method for processing goethite-containing bauxite to aluminum hydrate according to the Bayer technology, in which bauxite is digested in sodium hydroxide and the resulting material clarified to remove red mud, with an increased yield of aluminum hydrate and with decreased losses of sodium hydroxide, comprising conducting said digestion at 200° to 250°C. in an aluminate liquor containing $Na_2O_{caustic}$ in a concentration of 80 to 300 g./l., and a calcium compound selected from the group consisting of calcium carbonate, calcium oxide, calcium hydroxide and calcium sulfate in an amount corresponding to 2 to 6% by weight of CaO calculated on the dry weight of the bauxite and a sulfate salt selected from the group consisting of sodium sulfate and calcium sulfate in an amount corresponding to 1.0 to 7.0 g./l. of sulfate ion concentration, whereby the goethite content of the bauxite is converted into hematite.

4. A method for processing goethite-containing bauxite to aluminum hydrate according to the Bayer technology, in which bauxite is digested in sodium hydroxide and the resulting material clarified to remove red mud, with an increased yield of aluminum hydrate and with decreased losses of sodium hydroxide, comprising conducting said digestion at 200° to 250°C. in an aluminate liquor containing $Na_2O_{caustic}$ in a concentration of 80 to 300 g./l., and calcined lime in an amount corresponding to 2 to 6% by weight of CaO calculated on the dry weight of the bauxite and sodium sulfate in an amount corresponding to 1.0 7.0 g./l. of sulfate ion concentration, whereby the goethite content of the bauxite is converted into hematite.

3,944,649

MULTISTAGE PROCESS FOR REMOVING SULFUR DIOXIDE FROM STACK GASES

Edwin L. Field; Charles R. Lamantia, both of Lexington; Richard R. Lunt, Acton; James E. Oberholtzer, Lexington, and James R. Valentine, Reading, all of Mass., assignors to Combustion Equipment Associates, Inc., New York, N.Y.

Filed Dec. 13, 1973, Ser. No. 424,212
Int. Cl.² C01B 17/00
U.S. Cl. 423—242 9 Claims

1. In a process for removing sulfur dioxide from stack gases which includes the steps of contacting stack gases with an aqueous wash liquid comprising a solution of one or more alkali metal compounds thereby to form a spent absorbent liquid containing the bisulfite, sulfite and sulfate salts of said alkali metal and then subsequently recovering at least a portion of the alkali metal ion values by reacting said bisulfite, sulfite and sulfate salts in said spent absorbent liquid with one or more calcium compounds to precipitate calcium sulfite and calcium sulfate, the improvement comprising (1) carrying out the step of reacting said bisulfite, sulfite and sulfate salts with said calcium compounds in multiple stages, said spent absorbent liquid introduced into the first stage having a total oxidizable sulfur concentration of at least about 0.1 molar, a ratio of bisulfite to sulfite ions of at lest one and a sulfate ion concentration of between about 0.1 and 2.8 molar whereby the reaction conditions of said first of said multiple stages are

maintained to effect the precipitation of a solids mixture of calcium sulfate and calcium sulfite in said first stage, said solids mixture having greatly enhanced settling and filtration characteristics, (2) limiting the mean residence time of said solids mixture in said first stage to not more than 30 minutes, and (3) transferring at least a portion of said solids mixture of calcium sulfate and calcium sulfite formed in said first stage to one or more succeeding stages to serve as seed crystals for the further precipitation of calcium salts.

3,944,650

PROCESS FOR REMOVING OXIDES OF SULFUR, DUST AND MIST FROM COMBUSTION WASTE GAS

Ryuichi Hirota, Tokyo; Hisashi Kakuta, Yokohama; Shigetado Matoba, Yokohama; Kenichi Shimizu, Yokohama; Ryoichi Kanno, Kanagawa, and Mitsuaki Narita, Chigasaki, all of Japan, assignors to Asahi Glass Company Ltd. and Mitsubishi Kakoki Kaisha Ltd., both of Tokyo, Japan

Filed Mar. 27, 1973, Ser. No. 345,341

Claims priority, application Japan, Mar. 27, 1973, 48-29822

Int. Cl.² C01B *17/00*

U.S. Cl. 423—242 **3 Claims**

1. A process for removing oxides of sulfur, sodium sulfite, sodium sulfate, dust and mist from combustion waste gas evolved from a glass melting furnace which comprises the steps of:

pre-scrubbing said combustion waste gas with an absorbing solution discharged from an absorption zone, whereby chiefly dust and mist particles are removed from said waste gas;

contacting said pre-scrubbed waste gas with an absorbing solution continuously supplied with at least one alkali absorbent selected from the group consisting of sodium hydroxide, sodium carbonate and sodium sulfite such that the concentration of absorbent in said solution is 0.1–3 weight % which solution cools said waste gas to a temperature of 50°–90°C and humidifies said waste gas by at least saturating said gas with moisture;

adjusting the pH of said absorbing solution discharged from said pre-scrubbing zone and the pH of said absorbing solution discharged from said contacting step to 5–7 and 6–9 respectively in order to prevent the formation of sodium carbonate; and

passing said contacted waste gas through a glass fiber filter of a density of 150–250 kg/m³ which is maintained in a moistened condition to promote the effective filtration of dust and mist from said contacted waste gas.

3,944,651

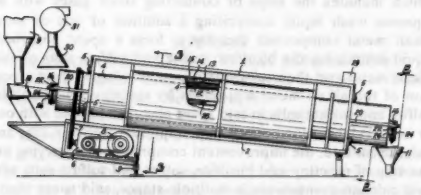
PROCESS FOR PUFFING BORAX

Godfrey B. D'Souza, Etobicoke, Canada, assignor to Canada Packers Limited, Toronto, Canada

Filed May 15, 1974, Ser. No. 470,295

Int. Cl.² C01B *15/12*

U.S. Cl. 423—279 **4 Claims**



1. A process for the continuous production of puffed borax having a bulk density in the range of about 12 to 20 lbs./cubic foot comprising: feeding granular sodium tetraborate pentahydrate into an externally heated rotary drier, tumbling the feed material as it passes through the drier while continuously scraping the interior wall of the drier to substantially prevent adherence of the material to the hot wall, maintaining the internal temperature of the drier in the temperature range of from about 220°F. to 450°F. while passing a stream of air counter current to the flow of borate through the drier, and adjusting the rate of flow of the material through the drier to provide a residence time sufficient to remove from about 1.4 to 2 molecules of water of hydration and provide a puffed borax product of said bulk density.

3,944,652

MICROBICIDAL AGENTS CONTAINING AS ACTIVE INGREDIENT MONOHYDROXYPHENYL CARBINOLS

Max Schellenbaum, Muttenz; Max Duennenberger, Frenkendorf, and Fulvio Casagrande, Binningen, all of Switzerland, assignors to Ciba-Geigy, Basel, Switzerland

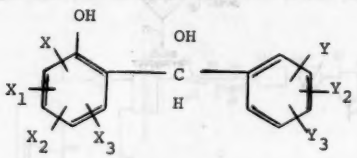
Division of Ser. No. 164,446, July 20, 1971, Pat. No. 3,879,479. This application Feb. 26, 1975, Ser. No. 553,350

Claims priority, application Switzerland, July 23, 1970, 11172/70

Int. Cl.² A01N *9/24*

U.S. Cl. 424—345 **17 Claims**

1. A method of combating bacteria or fungi which comprises applying thereto a bactericidally or fungicidally effective amount of a compound of the formula



wherein X is halogen; each of X_1, X_2, X_3 is hydrogen or halogen; Y is hydrogen, halogen or methyl; each of Y_2 and Y_3 are hydrogen or halogen and wherein at least two of X_1, X_2, X_3, Y, Y_2 and Y_3 are not hydrogen.

3,944,653

PROCESS FOR PREPARING HIGH PURITY ANTIMONY TRICHLORIDE AND ANTIMONY OXIDE FROM STIBNITE ORES

Robert D. Stewart, La Habra, and John R. McKinley, Claremont, both of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 284,981, Aug. 30, 1972, which is a continuation-in-part of Ser. No. 182,871, Sept. 22, 1971. This application Oct. 9, 1973, Ser. No. 404,618

Int. Cl.² C01B *9/00*

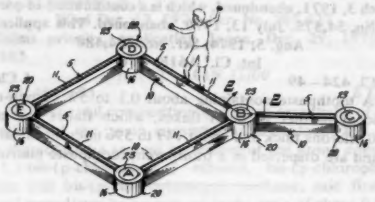
U.S. Cl. 423—491 **14 Claims**

1. A gas-liquid phase process for the production of antimony trichloride from antimony sulfide bearing ores and concentrates in particle form which comprises:

a. reacting antimony sulfide contained in a melt of antimony trichloride in at least one reaction zone with gaseous hydrogen chloride at a temperature above the melting point and below the boiling point of antimony trichloride to form molten antimony trichloride and hydrogen sulfide; and

b. purifying the formed antimony trichloride by fractional distillation, wherein the antimony trichloride is distilled and collected from an antimony trichloride containing distillable mass resulting from the reaction of antimony sulfide with hydrogen chloride.

3,944,654
BALANCE BEAM TRAINING APPARATUS
William J. Moore, 31 Tall Oaks, Suffern, N.Y. 10901
Filed Dec. 14, 1973, Ser. No. 424,734
Int. Cl.² A63B 1/02
U.S. Cl. 272—60 R 7 Claims



1. A modular arrangement of a beam element, a pedestal element of like height, connecting means joining these elements, said beam element being of uniform cross section throughout its length having a narrow rectangular top rail portion and a base portion of trapezoidal cross section, the trapezoidal section being about one half the height of the beam, each acute angle of the trapezoidal base portion being the same and being between about 70° – 75° to thereby provide an illusion of shallowness to a child walking the beam, said pedestal element having a recess in the side to accommodate said connecting means, and comprising a body having a well in its upper surface, a disc in said well bearing indicia and an aperture adapting a child to pick up the disc and see indicia on either surface.

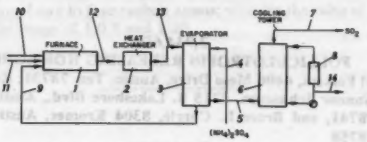
3,944,655
PROCESS OF PREPARING FOOD PRODUCTS FROM BONES
Ezra Levin, Champaign, and John Darwin Mosser, Monticello, both of Ill., assignors to VioBin Corporation, Monticello, Ill.
Filed Sept. 10, 1973, Ser. No. 395,717
Int. Cl.² A23J 1/10
U.S. Cl. 426—32 10 Claims

1. A process for making a liquid protein from the marrow of powdered bones which comprises dehydrating and extracting fat from said powdered bones to produce substantially fat free and moisture free particles including bone and bone marrow, contacting said particles in an aqueous mixture with the enzymes trypsin, amylase and lipase in an amount of each of said enzymes of at least 0.001 percent of the dry bone marrow by weight at a temperature of 15° C. to 23° C. and a pH of about 7 to 9 and for a time sufficient to enzymatically digest to solubilize a substantial amount of the protein of said bone marrow in said particles while solubilizing not more than a portion of the protein of the bone in said particles, and separating the protein solution from the residue.

3,944,656
PROCESS FOR THE PRODUCTION OF CYANOGEN CHLORIDE
William S. Durrell, Chappaqua, N.Y., and Robert J. Eckert, Jr., Mobile, Ala., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Jan. 10, 1974, Ser. No. 432,266
Int. Cl.² C01B 21/18
U.S. Cl. 423—379 5 Claims

1. A process for the production of cyanogen chloride wherein hydrogen cyanide and chlorine are reacted at a temperature of 90° to 300°C in the presence of a low activity carbon catalyst having a carbon tetrachloride activity of 1 to 10.

3,944,657
SULFUR DIOXIDE FROM BY-PRODUCT AMMONIUM SULFATE SOLUTIONS
Herbert Furkert, Grosskonigsdorf, Germany, assignor to Davy Powergas GmbH, Cologne-Braunsfeld, Germany
Continuation-in-part of Ser. No. 228,258, Feb. 22, 1975, Pat. No. 3,795,731. This application Jan. 15, 1973, Ser. No. 323,895
Claims priority, application Germany, Jan. 14, 1972, 2201632; Feb. 19, 1971, 2107910
The portion of the term of this patent subsequent to Mar. 5, 1991, has been disclaimed.
Int. Cl.² C01B 17/60, 17/50
U.S. Cl. 423—541 A 8 Claims



1. In a process comprising the steps of concentrating a neutral aqueous solution of ammonium sulfate obtained in the synthesis of organic compounds and burning resultant concentrate at 850°–1250° C to form a combustion gas containing SO_2 and SO_3, the improvement which comprises:

conducting said concentrating by passing said combustion gas having a temperature of 500°–1100° C in direct contact with said aqueous solution of ammonium sulfate to evaporate sufficient water from said solution to form solid ammonium sulfate having a moisture content of at least 3% by weight from said solution.

3,944,658
TRANSPARENT ACTIVATED NONPARTICULATE ALUMINA AND METHOD OF PREPARING SAME
Bulent E. Yoldas, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Division of Ser. No. 281,434, Aug. 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 234,303, March 13, 1972, abandoned. This application Sept. 13, 1973, Ser. No. 396,754
Int. Cl.² C01F 7/02; B01J 23/08
U.S. Cl. 423—626 18 Claims

1. A method for preparing a transparent, monolithic, nonparticulate, porous product consisting essentially of alumina with a total porosity of at least 50% which comprises the steps of:

a. providing an acid peptized, clear colloidal solution by hydrolyzing an aluminum alkoxide of the formula $Al(OR)_3$, wherein R is an alkyl of 1–24 carbon atoms, with water, wherein the mole ratio of water to said alkoxide is at least 8:1 and wherein said acid peptization is effected with about 0.03 to about 0.250 moles of acid per mole of said alkoxide, said acid having an ionization constant of at least 1×10^{-5} and having a noncomplexing anion with aluminum,

b. gelling said clear solution, and

c. drying said gel and pyrolyzing same by heating at a rate sufficiently slow to preclude cracking at a temperature in excess of about 500°C. and for a time insufficient to form alpha Al_2O_3 but sufficient to form said transparent, monolithic, porous, nonparticulate Al_2O_3 product.

18. A method for preparing a transparent, monolithic, nonparticulate, porous product consisting essentially of Al_2O_3 which comprises the steps of:

a. providing a gel of the hydrolysis product obtained by hydrolyzing an aluminum alkoxide of the formula $Al(OR)_3$, wherein R is an alkyl of 1–24 carbon atoms, with water and an acid wherein the mole ratio of water to said alkoxide is in the range of 8:1 to 20:1 and wherein said

acid is employed in an amount of about .03 to about .250 moles of acid per mole of said alkoxide, said acid having an ionization constant of at least 1×10^{-5} and having a noncomplexing anion with aluminum,

b. drying said gel, and

c. pyrolyzing said gel by heating at a rate sufficiently slow to preclude cracking at a temperature in excess of about 500°C. so as to form said transparent, monolithic, porous, nonparticulate Al_2O_3 product, said heating being insufficient to form alpha alumina.

3,944,659

FOLLICULOTROPIN RELEASING HORMONE

Karl Folkers, 6406 Mesa Drive, Austin, Tex. 78731; Karl Nils Gunnar Johansson, 2215 S. Lakeshore Blvd., Austin, Tex. 78741, and Bruce L. Currie, 8304 Kromer, Austin, Tex. 78758

Filed Dec. 13, 1972, Ser. No. 314,750

Int. Cl. A61k *27/04, 17/08*

U.S. Cl. 424—1 **4 Claims**

1. The new and partially isolated hypothalamic hormone, Folliculotropin Releasing Hormone (FRH), which fulfills the same biological function as the intact hypothalamus of mammalians of releasing folliculotropin and which has an Rf of about 0.4 on cellulose TLC in the solvent system chloroform-methanol-32% acetic acid (60:45:20) and an Γf of about 0.6 on cellulose TLC in the solvent system chloroform-methanol-29% ammonium hydroxide (60:45:20).

3,944,660

PHARMACEUTICAL COMPOSITION

Siegfried Gottfried, Ilford, and Lily Baxendale, London, both of England, assignors to Biorex Laboratories, Limited, London, England

Filed Nov. 28, 1973, Ser. No. 419,487

Claims priority, application United Kingdom, Dec. 18, 1972, 58354/72

Int. Cl.² A61K *9/46, 47/00, 33/06, 31/19*

U.S. Cl. 424—44 **11 Claims**

1. A pharmaceutical composition in uncoated tablet dosage unit form useful for treating oesophagitis comprising (a) 1–100 mg. of at least one member selected from the group consisting of glycyrrhetinic acid, the hemiesters thereof, and the salts of the hemiesters, in admixture with (b) 1–50% by weight of at least one member selected from the group consisting of alginic acid, the non-toxic salts of alginic acid, the carboxyalkyl-cellulose and the non-toxic salts of the carboxyalkyl-celluloses, (c) 1–30% by weight of at least one member selected from the group consisting of the non-toxic carbonates and bicarbonates and (d) 0–30% by weight of at least one antacid compound selected from the group consisting of aluminum hydroxide, aluminum phosphate, dihydroxyaluminum aminoacetate, magnesium hydroxide, and magnesium trisilicate, said tablet composition capable of forming a colloidal solution in the stomach, whereby the carbonate or bicarbonate component (c) reacts with the acid medium in the stomach to evolve carbon dioxide gas which foams up the colloidal solution, thereby filling the lower oesophagus with a long lasting foam containing the active glycyrrhetinic acid component (a) which remains in contact with the inflammatory site in the oesophagus for a time sufficient to promote prolonged and beneficial results.

3,944,661

DENTIFRICES CONTAINING IRIDESCENT FLAKES

Daniel Colodney, Somerville, N.J.; John J. Steinke, Fayetteville, N.Y., and Robert Mitchell, Somerset, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 319,947, Dec. 29, 1972, abandoned, which is a continuation-in-part of Ser. No. 287,185, Sept. 5, 1972, abandoned, which is a continuation of Ser. No. 120,697, March 3, 1971, abandoned, which is a continuation-in-part of Ser. No. 54,575, July 13, 1970, abandoned. This application Aug. 5, 1974, Ser. No. 494,480

Int. Cl.² A61K *7/16*

U.S. Cl. 424—49 **6 Claims**

1. A toothpaste containing about 0.1 to 5% of non-toxic iridescent mother of pearl flakes, which flakes are about 10–50 microns thick and about 149 to 590 microns in particle size and are dispersed in a transparent toothpaste matrix.

3,944,662

NON-VOLATILE SLOW-RELEASE PESTICIDAL GENERATORS

Alexander Miller, Jr., and Juan G. Morales, both of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 244,942, April 17, 1972, abandoned. This application Oct. 7, 1974, Ser. No. 512,652

Int. Cl.² A61K *31/74;* **A01N** *9/36*

U.S. Cl. 424—78 **10 Claims**

1. A storage stable, slow-release pesticide composition for controlling invertebrate pests consisting essentially of a pesticidally effective amount of from about 3% to 30% by weight of the total composition of β-2-chloro-1-(2,4,5-trichlorophenyl)-vinyl dimethyl phosphate dispersed in a matrix of plasticized thermoplastic resin compatible with said phosphate and capable of releasing a pesticidally effective amount of said phosphate onto the surface of said composition, said composition being characterized by having on the surface thereof a polymorphic form of β-2-chloro-1-(2,4,5-trichlorophenyl)-vinyl dimethyl phosphate further characterized by a platelet-like crystalline structure and a melting point of 95°–98°C, which crystalline structure inhibits migration of further quantities of β-2-chloro-1-(2,4,5-trichlorophenyl)-vinyl dimethyl phosphate from within the matrix onto the surface thereof.

3,944,663

MILD LIGHT DUTY DETERGENT CONTAINING HOMOPOLYMERS OF ETHYLENE OXIDE

Sidney Weiss, Levittown, Pa.; Victor Temnikow, Irvington, and Edward Eigen, East Brunswick, both of N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Continuation of Ser. No. 153,792, June 16, 1971, abandoned. This application July 9, 1973, Ser. No. 377,866

Int. Cl.² A61K *7/40, 7/50;* **C11D** *3/20, 3/48*

U.S. Cl. 424—78 **4 Claims**

1. A method for substantially reducing skin irritation of the hands by a light duty liquid or powder detergent formulation consisting essentially of 10% to 35% by weight of a water-soluble anionic surfactant having skin irritating characteristics and selected from the group consisting of C_8–C_{18} alkyl benzene sulfonates, C_8–C_{18} alkyl sulfates containing from 0 to 3 ethenoxy groups in the molecule, C_8–C_{22} olefin sulfonates, C_{16}–C_{20} paraffin sulfonates, C_8–C_9 alkyl phenol ethoxamer sulfates, and mixtures thereof which comprises contacting the hands with an aqueous washing solution of said detergent formulation containing said skin-irritating detergent and an effective amount of a homopolymer of ethylene oxide having the general formula $(CH_2CH_2O)_n$ wherein n is an integer sufficient to provide a molecular weight between about 1×10^5 and 4×10^6, said polymer being from about 0.01 to about 5% by weight of said formulation, with the balance of said formulation being either sodium sulfate or an aqueous medium containing up to 15% by weight of a solubilizing agent

selected from the group consisting of C_2–C_3 alkanols, polyethylene glycols and sodium xylene sulfonate.

3,944,664

SYNERGISTIC ACARICIDE COMPOSITIONS

Tadaharu Kitagaki; Yoshio Takahashi, both of Shizuoka, and Kiyoshi Takita, Shimizu, all of Japan, assignors to Sandoz, Inc., E. Hanover, N.J.

Filed Dec. 13, 1971, Ser. No. 207,627

Claims priority, application Japan, Dec. 29, 1970, 45-130183

Int. Cl.² A01N *15/00*

U.S. Cl. 424—93 8 Claims

1. An acaricidal composition consisting essentially of a first ingredient of the group consisting of β-exotoxin and metal salts thereof and a second ingredient of the group consisting of 1,1-bis-(p-chlorophenyl) ethanol, bis-(p-chlorophenyl) sulfide and bis-(p-chlorophenoxy) methane; said first and second ingredients being present in the ratio of about 0.5:1 to about 10:1 by weight.

3,944,665

NOVEL BIOLOGICALLY-ACTIVE COMPOUNDS AND METHOD FOR ISOLATING THEM FROM RAW MATERIALS CONTAINING INSULIN

Armen Anushavanovich Galoian, ulitsa Ter-Gabrielyana, 2, kv. 66; Ruben Arshakovich Alexanian, ulitsa Moskovskaya, 60, kv. 29, and Mavra Vagarshanovna Oganian, ulitsa Orbeli, 7, kv. 39, all of Erevan, U.S.S.R.

Filed Jan. 22, 1974, Ser. No. 435,469

Claims priority, application U.S.S.R., Feb. 15, 1973, 1882646

Int. Cl.² A61K *27/00*

U.S. Cl. 424—101 3 Claims

1. A method of isolating biologically-active compounds which exhibit a coronary dilating effect from the venous blood of the pancreas comprising dialyzing the serum of the venous blood of the pancreas against a 2N solution of acetic acid at a temperature of 3–10°C for from 24 to 28 hours, lyophilizing the dialyzate, gel filtering the lyophilizate on a column with packing having a pore size of 200–400mμ, and separating said compounds from each other by down-flow paper chromatography using said butyl alcohol-acetic acid-water solvent system in a ration of 4:1:5 followed by high voltage paper electrophoresis in an electrophoretic field of 1,500 volts in a citrate buffer, at an ionic strength of 0.1 and a current density of 1.2 mA/cm.

3,944,666

INSECTICIDAL COMPOSITIONS AND METHODS OF COMBATTING INSECTS USING 3-PHENOXYBENZYL 2,2-DIMETHYL-3-(2,2-DICHLOROVINYL)-CYCLOPROPANECARBOXYLATE INSECTICIDE WITH A SYNERGISTIC COMPOUND OF MONO (ALKYL AND ALKENYL)MONO OMEGA-ALKYNYL ARYLPHOSPHONATES

Ronald Eugene Montgomery, Middleport, and Harry Hobart Incho, Medina, both of N.Y., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 294,238, Oct. 2, 1972, Pat. No. 3,885,031, which is a division of Ser. No. 122,168, March 8, 1971, Pat. No. 3,709,988, which is a division of Ser. No. 800,264, Feb. 18, 1969, Pat. No. 3,652,741, which is a continuation-in-part of Ser. No. 630,204, April 12, 1967, abandoned, which is a continuation-in-part of Ser. Nos. 559,422, June 22, 1966, abandoned, and Ser. No. 624,689, March 21, 1967, abandoned. This application Nov. 15, 1974, Ser. No. 524,376

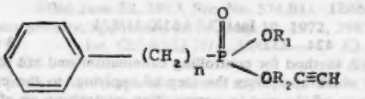
Int. Cl.² A01N *9/02, 9/24, 9/36*

U.S. Cl. 424—219 12 Claims

1. An insecticidal composition comprising an insecticidally effective amount of a combination of

A. 3-phenoxybenzyl 2,2-dimethyl-3-(2,2-dichlorovinyl)cyclopropanecarboxylate the insecticidal activity of which is synergized by

B. a synergistically effective amount of a compound of the formula



wherein n is 0 or 1, R_1 is selected from the group consisting of alkyl and alkenyl having one to six carbon atoms; and R_2 is alkylene of one to four carbon atoms; wherein the ratio of A:B is in the range of 1:0.5 and 1:20.

3,944,667

FORMYLAZAPENTADIENENITRILES

Kurt Klemm, Allensbach, and Erhard Langenscheid, Constance, both of Germany, assignors to Byk Gulden Lomberg Chemische Fabrik GmbH, Constance, Germany

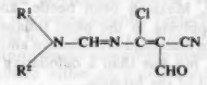
Filed Sept. 4, 1973, Ser. No. 393,811

Claims priority, application Luxemburg, Sept. 8, 1972, 66036; Sept. 8, 1972, 66037; Sept. 8, 1972, 66038

Int. Cl.² C07C *121/34;* A61L *13/00;* A01N *9/22;* C07C *121/48*

U.S. Cl. 424—244 5 Claims

1. A compound of the formula



wherein

R^1 is alkyl with from 1 to 7 carbon atoms, cycloalkyl with from 3 to 6 ring carbon atoms or, together with R^2, alkylene with from 2 to 5 carbon atoms;

R^2 is alkyl with from 1 to 7 carbon atoms, cycloalkyl with from 3 to 6 ring carbon atoms or, together with R^1, alkylene with from 2 to 5 carbon atoms;

in free base or acid addition salt form.

4. A microbiocidal composition consisting essentially of active ingredient and carrier, a microbiocidally-active ingredient of which is a compound according to claim 1.

5. An insecticidal composition consisting essentially of active ingredient and carrier, the composition containing an insecticidally-effective concentration of an insecticidally-active compound according to claim 1.

3,944,668

ANTIMICROBIAL COMPOSITIONS

David Frederick Cleaver, Hale Barns, England, assignor to Paterson Zochonis & Company, Limited, England

Filed Mar. 29, 1974, Ser. No. 456,199

Int. Cl.² A61K *31/65*

U.S. Cl. 424—227 1 Claim

1. A stable antimicrobial composition for topical or oral application comprising from 1 to 3% of tetracycline, from 1 to 3% of 5-chloro-8-hydroxyquinoline or 5,7-chloro-8-hydroxyquinoline and a pharmaceutically acceptable diluent or carrier.

3,944,669

METHODS FOR CONTROLLING CANNIBALISM AND TAIL BITING IN PIGS

Maurice Pastre, Lyon, France, assignor to Pepro, France

Filed Feb. 12, 1974, Ser. No. 441,758
Claims priority, application France, Feb. 14, 1973, 73.05851
Int. Cl.² A61K 31/625
U.S. Cl. 424—232 3 Claims

1. A method for controlling cannibalism and tail biting in pigs which comprises the step of applying, to the external surfaces of the pigs, a composition comprising an effective amount to prevent tail biting and cannibalism of an 8-hydroxy quinoline compound selected from the group consisting of at least one of 8-hydroxy quinoline; the double sulfate of potassium and 8-hydroxy quinoline; the neutral sulfate of 8-hydroxy quinoline; the salicylate, citrate, tartrate sorbate and cinnamate of 8-hydroxy quinoline; 5 nitro-8-hydroxy quinoline; 8-hydroxy quinoline sulfathiazole phthalate; 2-iodo-8-hydroxy quinoline-5-sulfonic acid and the 8-hydroxy quinolinate of bismuth, aluminum, copper or zinc.

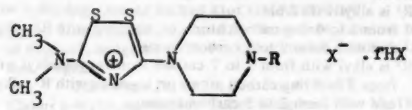
3,944,670

PESTICIDAL DITHIAZOLIUM SALTS

Russell F. Bellina, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 304,793, Nov. 8, 1972, abandoned. This application May 8, 1973, Ser. No. 358,395
Int. Cl.² A01N 9/22
U.S. Cl. 424—250 13 Claims

1. A method for protecting plants from mites, aphids, Colorado potato beetle, Mexican bean beetle, and boll weevil which comprises applying to the plant foliage a miticidally effective amount, an insecticidally effective amount or a plant protective amount, but less than a defoliating amount of at least one compound of the formula



where

R is alkyl of 1 through 6 carbon atoms;

X^- is an anion of the corresponding acid HX having an ionization constant of at least 1×10^{-7}; and *f* is 0 or 1.

3,944,671

TREATMENT OF ADRENAL MALFUNCTION

Robert Dziemian, Cedar Knolls, and Neville Finch, West Orange, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sept. 12, 1973, Ser. No. 396,969
Int. Cl.² A61K 31/445
U.S. Cl. 424—267 10 Claims

1. A pharmaceutical composition for reducing adrenal hyperfunction, comprising an adrenal secretion reducing amount of the dextrorotatory antipode of an α-(4-aminophenyl)-α-lower alkylglutarimide or a therapeutically acceptable acid addition salt thereof, and a pharmaceutical excipient.

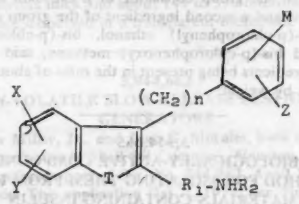
3,944,672

METHOD FOR TREATING MICROBIAL INFECTIONS

Martin Steinman, Livingston, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 314,899, Dec. 13, 1972, abandoned. This application May 28, 1974, Ser. No. 473,625
Claims priority, application United Kingdom, Dec. 3, 1973, 55819/73
Int. Cl.² A61K 31/40
U.S. Cl. 424—274 17 Claims

1. A method for treating susceptible microbial infections, selected from the group consisting of bacterial, fungal and protozoal infections, which comprises administering to an animal species so infected an antimicrobially effective quantity of a compound represented by the formula:



wherein *n* is 0 or 1; R_2 is hydrogen, or amino lower alkylene having 1 to 3 carbon atoms; R_1 is carbonyl or lower alkylene having 1 to 3 carbon atoms with the provisio that when R_2 is hydrogen, R_1 is lower alkylene; T is NH; X is halogen, nitro, or trifluoromethyl; Y is hydrogen, halogen, methyl or trifluoromethyl; M is hydrogen, halogen or methyl with the provisio that when X is nitro, M is halogen; Z is hydrogen, halogen, nitro or methyl; or the acid addition salts thereof.

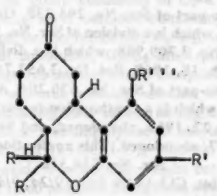
3,944,673

HEXAHYDRO-DIBENZO[B,D]PYRAN-9-ONES AS ANALGESIC DRUGS

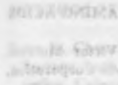
Robert A. Archer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 413,009, Nov. 5, 1973. This application May 23, 1975, Ser. No. 580,391
Int. Cl.² A61K 31/35
U.S. Cl. 424—283 7 Claims

1. A process for providing analgesia to mammals suffering from pain which comprises administering to a mammal in need of analgesia an analgetic dose of a compound represented by the formula



wherein R′ is either C_7–C_{10} normal alkyl or is the group



wherein R'' is C_5–C_7 alkyl and R^2 is H or methyl, wherein both R groups are identical and are H or methyl and wherein R''' is H or C_1–C_4 alkanoyl, in an amount effective to provide analgesia.

3,944,674

COMBATING INSECTS WITH O-DIMETHOXYMETHYLPHENYL-N-METHYLCARBAMATE

Erwin Nikles, Allschwill; Volker Dittrich, and Ladislaus Pinter, both of Basel, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 199,008, Nov. 15, 1971, Pat. No. 3,856,968, which is a continuation of Ser. No. 758,616, Sept. 9, 1968, abandoned, which is a continuation-in-part of Ser. No. 647,274, April 28, 1967, abandoned, which is a division of Ser. No. 493,256, Oct. 5, 1965, abandoned. This application Oct. 2, 1974, Ser. No. 511,408

Claims priority, application Switzerland, Oct. 8, 1964, 13113/64

Int. Cl.² A01N *9/20*

U.S. Cl. 424—300 **2 Claims**

1. A composition for combating insects comprising (1) as active ingredient an insecticidally effective amount of o-dimethoxymethylphenyl-N-methylcarbamate and (2) a suitable carrier.

3,944,675

SUBSTITUTED ARYL AND ARALKYL AMIDES IN THE TREATMENT OF PARKINSONISM

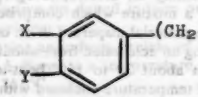
Samson Symchowicz, Livingston, N.J., and Hans-Peter Faro, Grafing near Munich, Germany, assignors to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 341,624, March 15, 1973, which is a continuation of Ser. No. 198,974, Nov. 15, 1971, abandoned. This application July 16, 1973, Ser. No. 379,524

Int. Cl.² A61K *31/165*

U.S. Cl. 424—324 **7 Claims**

1. A method of treating the symptoms of Parkinsonism which comprises administering to a mammal exhibiting such symptoms a therapeutically effective quantity of a compound of the formula:



wherein R is an acyl radical derived from a hydrocarbon carboxylic acid having from 3 to 11 carbon atoms; X and Y are members selected from the group consisting of hydrogen, fluoro, trifluoromethyl and hydroxy; and *n* is an integer selected from the group consisting of 0, 1 and 2.

3,944,676

PROCESS FOR THE MANUFACTURE OF SOYBEAN PROTEIN PRODUCTS

Eliahu Fridman, and Amior Dolev, both of Haifa, Israel, assignors to Centre for Industrial Research (CIR) Ltd, Haifa, Israel

Filed June 28, 1973, Ser. No. 374,811

Claims priority, application Israel, July 10, 1972, 39876

Int. Cl.² A23J *1/14, 3/00*

U.S. Cl. 426—46 **13 Claims**

1. A process for the manufacture of soybean products from soybean meal which comprises in combination the steps of: (a) leaching the soybean meal with an aqueous solution and separating the solid residue to obtain a soybean extract; (b) adjusting the pH of the soybean extract to a value between 6.5 – 7.0 to give a soybean milk; (c) sterilizing the soybean milk in order to destroy the antidigestive factors present in said soybean meal and to reduce the beany flavor of said meal; (d) fermenting said thus-obtained soybean milk after said sterilization with a lactic culture under conditions suitable to utilize natural sugar present in said soybean milk as a source of carbohydrates in order to produce a soybean curd; (e) separating the soybean curd and (f) transforming said curd into soybean products.

3,944,677

PERCOLATION PROCESS

Saul N. Katz, Monsey, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 442,720, Feb. 14, 1974, abandoned. This application June 3, 1975, Ser. No. 583,348

Int. Cl.² A23F *1/08;* B01D *11/02*

U.S. Cl. 426—432 **1 Claim**

1. In a coffee percolation process wherein roasted and ground coffee is countercurrently contacted with an aqueous extraction liquid in a series of extraction columns of a percolator set, the improvement comprising positioning said roasted and ground coffee within each extraction column such that the average particle size of the roasted and ground coffee continually decreases in the direction of flow of said aqueous extraction liquid throughout said extraction column.

3,944,678

PROCESS FOR THE FAST COOKING OF METERED QUANTITIES OF FOODSTUFF

Modesto Pratolongo, Milan, Italy, assignor to Santa Martha Bay Shipping and Trading Co., Ltd., Curacao, Netherlands Antilles

Division of Ser. No. 289,941, Sept. 18, 1972, Pat. No. 3,227,344. This application May 9, 1974, Ser. No. 468,561

Claims priority, application Italy, Oct. 9, 1971, 29724/71; Oct. 9, 1971, 29725/71; Oct. 9, 1971, 29726/71

Int. Cl.² A23L *1/00*

U.S. Cl. 426—508 **6 Claims**

1. A process for cooking foodstuffs from the group consisting of rice, noodles and spaghetti, comprising the steps of: introducing a metered quantity of the foodstuff into a cooking chamber having an inlet opening and an outlet opening, hermetically sealing the inlet opening and the outlet opening of said cooking chamber; introducing water under pressure at a temperature of over 100°C into the cooking chamber, extracting vapour from the cooking chamber by removing introduced water and foodstuffs through the outlet opening to obtain a rapid drop in pressure; and then removing excess water from the foodstuffs, removing vapour developed during the rapid drop in pressure from the foodstuffs and absorbing the kinetic energy developed in the foodstuffs during said removal from the cooking chamber by subjecting the foodstuffs to centrifugal force.

3,944,679

PROCESS FOR IMPARTING A COUMARIN-LIKE AROMA AND FLAVOR TO TOBACCO, FOODS AND DRINKS

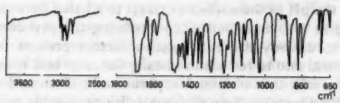
Hiroyasu Takahara; Isao Morishita, both of Yokohama; Mikio Shiga, and Toshikatsu Uchijima, both of Tokyo, all of Japan, assignors to The Japan Tobacco & Salt Public Corporation and Fuji Flavor Company, Limited, both of, Japan

Filed Apr. 8, 1974, Ser. No. 458,686

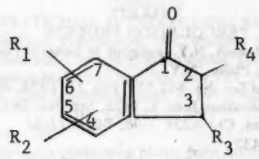
Claims priority, application Japan, Apr. 13, 1973, 48-41344; Jan. 24, 1974, 49-9689

Int. Cl.² A23L *1/226*

U.S. Cl. 426—538 15 Claims



1. Process for imparting a coumarin-like aroma and flavor to a consumable product selected from the group consisting of tobacco, food and drink, which comprises adding to said product at least one 2- and/or 3-alkyl-substituted indanone compound having the general structural formula:



(I)

where either each of R_1 and R_2 represents CH_3—, C_2H_5—, $(CH_3)_2CH$—, HO—, CH_3O— or C_2H_5O—, or R_1 combined with R_2 represents —O—CH_2—O—; and each of R_3 and R_4 represents H, CH_3, C_2H_5, n—C_3H_7 or $(CH_3)_2CH$—, excepting the case when both of R_3 and R_4 represent H.

3,944,680

PREPARATION OF WHIPPABLE EMULSIONS

Johannes George van Pelt; Albertus Prins, both of Schiedam; Johannes Hendrik van Roon, Vlaardingen, and Petrus Smits, Maassluis, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 361,692, May 18, 1973, abandoned. This application July 23, 1974, Ser. No. 491,087

Claims priority, application United Kingdom, May 8, 1973, 21939/73

Int. Cl.² A23J *3/02*; A23C *13/12*, *23/00*

U.S. Cl. 426—564 4 Claims

1. A process for the preparation of an aqueous oil emulsion of prolonged storage life, which can be whipped to an overrun of from 70 to 500 percent, which comprises:

a. preparing an aqueous phase having a pH in the range of 4.2 to 5.0 and containing from 0.5 to 4 percent of its weight of globular protein in the substantial absence of coagulated protein, of which globular protein at least 60 percent by weight is in the form of a complex with an anionic polysaccharide;

b. mixing the aqueous phase with an emulsifier selected from the group consisting of partial fatty acid esters of glycerol, partial fatty acid esters of propylene glycol and glycerolactopalmitate in an amount of from 0.3 to 2.0% by weight of the emulsion and with a fat in an amount of from 3 to 50 percent by weight of the emulsion at a temperature at which the fat is liquid; and,

c. homogenizing the mixture at a temperature at which the fat is liquid.

3,944,681

FOODS CONTAINING SALTS OF ACETYL AMINO ACIDS AS WATER BINDERS

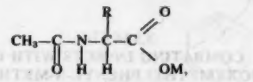
Herman H. Friedman, Bayside, N.Y., and Victor Moreno, Montreal, Canada, assignors to General Foods Corporation, White Plains, N.Y.

Filed Jan. 11, 1974, Ser. No. 432,723

Int. Cl.² A21D *4/00*

U.S. Cl. 426—615 10 Claims

1. A food product comprising: (a) a material selected from the group consisting of meat, fish, poultry, fruits and vegetables, which tends to lose water when exposed to the atmosphere; and (b) an amount, effective to bind water and reduce the tendency for water loss from the composition, of a water binding compound defined by the formula



Wherein: R is a member selected from the group consisting of $-(CH_2)_n-CO_2M$, $-(CH_2)_n-NO_3$, $-(CH_2)_n-SO_3M$, and $-(CH_2)_n-NH_2$; *n* is an integer from 1 to 4; and M is an alkali metal.

3,944,682

METHOD OF PROVIDING AN ELECTROPHOTOGRAPHIC COATING AND COMPOSITIONS FOR THE METHOD

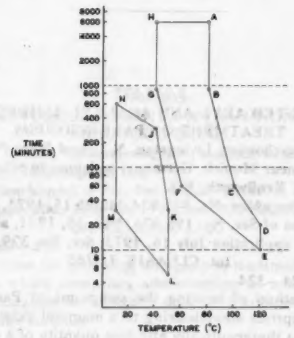
Hajime Miyatsuka; Satoru Honjo; Kenichi Sawada, and Takashi Saida, all of Asaka, Japan, assignors to Rank Xerox, Ltd., London, England

Filed Nov. 14, 1973, Ser. No. 415,597

Claims priority, application Japan, Dec. 28, 1972, 47-482421

Int. Cl.² B05D *5/12*

U.S. Cl. 427—74 4 Claims



1. A method of forming an electrophotographic article comprising: preparing a mixture which comprises finely divided photoconductive material dispersed in an organic resin binder, said resin having an acid value from about 5 to 40, or a hydroxyl value from about 20 to 150, heat-treating said mixture for a time and temperature enclosed within the areas ABCDEFGH of the temperature-treating diagram shown in the accompanying drawing, followed by dispersing said mixture into a volatile solvent for said binder resin, coating said dispersion on a conductive backing to form a substantially uniform layer, and drying said layer under the conditions enclosed within the areas JKLMN of the drawing.

3,944,683

METHODS OF PRODUCING CHEMICALLY HARDENING COATINGS

Peter K. Church, Cascade, and Oliver J. Knutson, Colorado Springs, both of Colo., assignors to Kaman Sciences Corporation, Colorado Springs, Colo.

Division of Ser. No. 694,303, Dec. 28, 1967, Pat. No. 3,789,096, which is a continuation-in-part of Ser. No. 642,704, June 1, 1967, abandoned. This application Feb. 2, 1970, Ser. No. 7,948

Int. Cl.[2] B05D *1/02, 1/10, 3/02, 1/08*

U.S. Cl. 427—34 28 Claims

1. A method of producing a chemically hardened refractory coating on a substrate having a porous coating thereon of a refractory oxide having a vitrification temperature in excess of 600°F. which comprises:

impregnating the porous oxide coating with a solution of a chromium compound which is capable of being converted to an oxide on being heated;

drying and curing said impregnated coating by heating same to a temperature below the vitrification temperature of the oxide but sufficient to convert the chromium compound in situ to an oxide; and,

repeating the impregnation and curing steps at least once to harden and densify the coating.

3,944,684

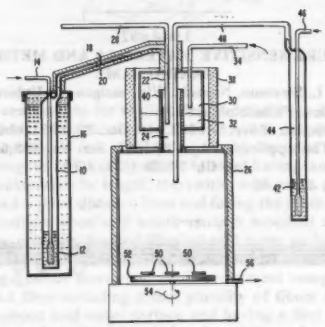
PROCESS FOR DEPOSITING TRANSPARENT, ELECTRICALLY CONDUCTIVE TIN CONTAINING OXIDE COATINGS ON A SUBSTRATE

James Kane, Affoltern am Albis, and Hanspeter Schweizer, Zurich, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 391,359, Aug. 24, 1973. This application May 22, 1974, Ser. No. 472,294

Int. Cl.[2] B05D *5/12;* C23C *11/08*

U.S. Cl. 427—109 11 Claims



9. The process of depositing transparent, uniform, electrically conductive tin doped indium oxide coatings on a substrate comprising:

a. vaporizing an indium chelate of 2,2,6,6-tetramethylheptane-3,5-dione at a temperature of from about 180° to about 250°C.,

b. vaporizing dibutyl tin diacetate at a temperature of from about 80°C. to about 120°C.,

c. heating said substrate to a temperature of from about 350°C. to about 550°C.,

d. and contacting said heated substrate with said indium vapor and said tin vapor in an oxidizing atmosphere.

3,944,685

PREPARATION OF HEAT BARRIER MATERIALS

Rudy W. Gunnerman, Beverly Hills, Calif., assignor to Plastonium, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 763,931, Sept. 30, 1968, abandoned, which is a division of Ser. No. 713,231, March 14, 1968, abandoned. This application June 28, 1971, Ser. No. 157,732

Int. Cl.[2] B05D *3/08*

U.S. Cl. 427—223 12 Claims

1. The method of forming a heat barrier which includes applying to a surface of a shaped intimate admixture of alkaline earth sulfate and thermosetting plastic of reduced particle size, a heat source to produce an adherent alkaline earth sulfide layer upon said surface to thereby form a a heat barrier coating resistant to the penetration of thermal energy into the body of said admixture, and using said admixture as a heat barrier material.

3,944,686

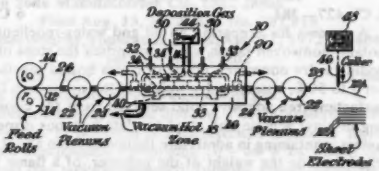
METHOD FOR VAPOR DEPOSITING PYROLYTIC CARBON ON POROUS SHEETS OF CARBON MATERIAL

Robert W. Froberg, Easton, Pa., assignor to Pfizer Inc., New York, N.Y.

Filed June 19, 1974, Ser. No. 480,922

Int. Cl.[2] C01B *31/04;* C23C *11/00*

U.S. Cl. 427—228 11 Claims



1. A method of infiltrating a sheet of porous fibrous carbon with pyrolytic graphite comprising the steps of traversing an elongated sheet of porous fibrous carbon in a longitudinal path of travel, drawing a subatmospheric pressure in a treating zone in said path to reduce sooting, heating the sheet in the treating zone to a pyrolytic carbon-deposition temperature, impinging relatively narrow flow streams of hydrocarbon gas upon the heated sheet in the treating zone through a number of substantially restricted flow channels directed at the sheet to cause the gas to flow at a velocity of from about 20 to about 200 (STP) feet per minute whereby a deposit of pyrolytic graphite is infiltrated on the sheet without substantially obstructing the flow channels.

3,944,687

METHOD OF PREPARING PURIFYING AGENTS CONSISTING OF ACTIVATED SILICEOUS POROUS MINERAL SUBSTANCES

Kazuo Morisaki, and Mikio Watanabe, both of Fukui, Japan, assignors to Sakai Sen-i Kogyo Kabushiki Kaisha and Hokuriku Kakoki Kabushiki Kaisha, both of Fukui, Japan

Filed July 2, 1973, Ser. No. 375,699

Claims priority, application Japan, Apr. 17, 1973, 48-42716

Int. Cl.[2] B05D *3/02, 5/00*

U.S. Cl. 427—372 5 Claims

1. Method of preparing activated siliceous porous mineral substances so as to increase the ability thereof to purify waste waters and the like, which consists essentially of impregnating an adsorptive siliceous porous mineral substance containing water insoluble SiO_2 and a water insoluble metal oxide and being selected from the group consisting of diatomaceous earth and foamed perlite with at least one mineral acid selected from the group consisting of hydrochloric acid and sulphuric acid in an amount sufficient to convert a predetermined quantity of said insoluble metal oxide to the corre-

sponding water soluble salt, baking the thus impregnated porous mineral substance at a temperature of from 100° C to 500°C for a time sufficient to convert said predetermined quantity of said water insoluble metal oxide into the corresponding water soluble salt which remains within the porous structure of said porous mineral substance and there acts as coagulant for impurities in waste water and the like to increase the purifying action of said adsorptive siliceous porous mineral substance while said SiO_2 remains in its water insoluble adsorbent form, and retaining said water soluble metal salt in said porous structure of said activated siliceous porous mineral substance until the same is used for the purification of waste waters and the like.

3,944,688

METHOD FOR THE MANUFACTURE OF WATER-REPELLENT, FIRE-RESISTANT NONWOVEN FABRICS

Charles Edward Inman, Glenside, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 23, 1973, Ser. No. 408,687
Int. Cl.² B44D 1/46; C09K 3/28
U.S. Cl. 427—381 6 Claims

1. A process for preparing an oil and water repellent, fire retardant, nonwoven fabric which comprises the steps of: (A) providing a dry nonwoven fabric of fibers bound together by about 5 to 50%, based on dry weight of the nonwoven fabric, of surfactant-free adhesive solid selected from the class consisting of vinyl acetate and alkyl acrylate aqueous dispersion polymers, containing in admixture therewith from about 25 to 110%, based on the weight of the polymer, of a flame retardant agent selected from the group consisting of halogen, phosphorus and halogen and phosphorus containing flame retardants; (B) treating the fabric with an aqueous bath containing in admixture a fluorochemical oil and water-repellent composition in an amount sufficient to deposit on the fabric from about 0.05 to 0.8% solids by weight thereof, based on the dry fabric weight, and drying the fabric.

3,944,689

GLOSSY COATING COMPOSITIONS FROM COPOLYMERS OF VINYLIDENE FLUORIDE

Glenn W. Luckock, Natrona Heights, and William V. Warnick, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 22, 1971, Ser. No. 191,809
Int. Cl.² C08K 5/07, 5/16, 5/20
U.S. Cl. 427—385 14 Claims

1. A coating composition which dries in air at ambient temperature to form a high gloss, continuous film, comprising:

A. from about 20 percent to about 70 percent, based on the total weight of (A) and (B), of a fluorocarbon polymer comprising from about 95 percent to about 60 percent by weight of vinylidene fluoride and from about 5 percent to about 40 percent by weight of tetrafluoroethylene or perfluoropropene;

B. from about 30 percent to about 80 percent, based on the total weight of (A) and (B), of an acrylate polymer;

wherein Components (A) and (B) are dissolved in gloss-enhancing solvent comprising a member selected from the class consisting of 2-nitropropane, cyclohexanone, dimethylacetamide, and combinations thereof.

3,944,690

PRODUCTION OF NONWOVEN FABRICS

Dieter Distler, Mutterstadt; Kurt Wendel, Ludwigshafen; Andreas Einwiller, Mannheim, and Knut Oppenlaender, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation-in-part of Ser. No. 362,901, May 23, 1973, Pat. No. 3,878,152. This application Jan. 30, 1975, Ser. No. 545,758
Claims priority, application Germany, Dec. 29, 1972, 2263921; May 30, 1972, 2226269; Feb. 10, 1973, 2306541
Int. Cl.² D06M 15/12
U.S. Cl. 427—390 8 Claims

1. In a process for binding nonwoven fabrics by impregnating the fabrics with anionic or non-ionic aqueous heat-sensitized polymer dispersions and drying the impregnated fabrics at elevated temperature in the usual manner, the improvement of using a polymer dispersion containing 2 to 10 percent by weight, based on the polymer, of a polyalkoxylated aliphatic amine containing from 1 to 10 amino groups and being alkoxylated with an alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide, and both ethylene and propylene oxides, said polyalkoxylated amine having inverse solubility and a mean molecular weight of from 200 to 15,000, as measured by the hydroxyl number determined by the acetic anhydride method, and said polymer dispersion containing said polyalkoxylated amine having a pH below 6.

3,944,691

DECORATIVE ASSEMBLY OR TOY

John A. Smith, 1706 W. Dallas, Selma, Ala. 36701

Filed Apr. 9, 1974, Ser. No. 459,284
Int. Cl.² B44F 7/00
U.S. Cl. 428—13 4 Claims

1. A decorative assembly comprising a transparent casting made from a moldable and transparent synthetic resin representing an image of a mascot and an opague image of another mascot embedded within said first mascot in a manner and position to give the appearance of having been devoured by said first mascot.

3,944,692

PRESSURE SENSITIVE MATERIALS AND METHODS OF MAKING SAME

Starkie L. Swenson, Neenah, Wis., assignor to Unisource Corporation, Philadelphia, Pa.

Continuation of Ser. No. 212,046, Dec. 27, 1971, abandoned. This application Apr. 8, 1974, Ser. No. 458,658
Int. Cl.² B32B 3/28, 3/30
U.S. Cl. 428—40 2 Claims

1. In a pressure sensitive material, a printing paper sheet and a backing sheet of fibrous material having coextensive facing surfaces, a layer of adhesive material sandwiched between said coextensive facing surfaces of said paper sheet and said backing sheet, and a coating of an adhesive release agent on the surface of said backing sheet engaged with said adhesive layer, said release agent providing a predetermined releasability factor, said backing sheet having uniformly distributed undulations therein of a predetermined size and in a swirled waffle pattern such that a predetermined percentage of the total area of said adhesive layer is in engagement with said coating with such engagement being uniformly distributed throughout said surface of said backing sheet, said undulations being smooth and rounded to facilitate letter press printing and to minimize fracturing of fibers of said backing sheet and release of loose fibers into said adhesive material,

said backing sheet also having a predetermined degree of stretchability and being contracted to a predetermined degree in forming said smooth and rounded undulations, said predetermined releasability factor and said predetermined percentage being high enough and said predetermined size of said undulations, said predetermined degree of stretchability and said predetermined degree of contraction being low enough to substantially obviate relative movement of said printing paper sheet and said backing sheet during letter press printing and to permit accurate letter press printing of said printing paper sheet without mottling, said predetermined releasability factor and said predetermined percentage being also low enough and the size of said undulations, said predetermined degree of stretchability and said predetermined degree of contraction being large enough to permit ready removal of said backing sheet by engagement of the finger of a user therewith, said predetermined releasability factor being on the order of 30–40 grams per lineal inch on the Keil scale, said predetermined percentage being from 40 to 60%, said predetermined degree of stretchability being less than 10% and said degree of contraction being from 2 to 10%.

3,944,693

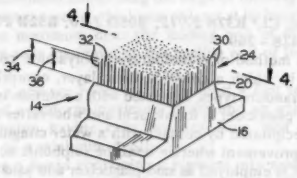
FLOCKED WEATHERSTRIP

Aaron J. Ungerer, Schenectady, N.Y., assignor to The Standard Products Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 264,910, June 21, 1972, abandoned. This application June 10, 1974, Ser. No. 477,621

Int. Cl.² B05D *1/14, 1/16;* **B32B** *33/00*

U.S. Cl. 428—89 **6 Claims**



1. In a weatherstrip for sealing the space between cooperable relatively movable closure members, said weatherstrip being mountable on one of said closure members and including an elongate body of synthetic plastic having an outer surface coextensive in length therewith, said outer surface being spaced a given distance from and facing the other of said closure members when said weatherstrip is mounted on said one closure member, flocked fiber on said outer surface and projecting therefrom toward said other closure member for sealing engagement therewith, the improvement comprising: said flocked fiber including a first plurality of fibers distributed throughout said outer surface and having a first denier and a first length, and a second plurality of fibers distributed throughout said first plurality of fibers and having a second denier generally 15 to 40% of said first denier and a second length generally 40 to 60% of said first length.

3,944,694

ARTICLE FOR CONDITIONING FABRICS IN A CLOTHES DRYER

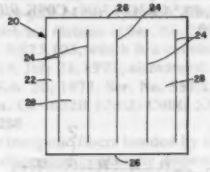
Agnes R. McQueary, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 3, 1973, Ser. No. 347,605

Int. Cl.² B32B *3/10*

U.S. Cl. 428—131 **10 Claims**

1. A fabric conditioning article comprising a flexible web substrate carrying a fabric-conditioning agent removable to fabrics by contact therewith in a laundry dryer, said web substrate containing slit openings sufficient in size and number



as to permit at least about 75 percent of the normal volume of air flow through said dryer when said article is used therein.

3,944,695

HEAT PRINTING SHEET

Yujiro Kosaka, Tokyo; Hitoshi Kuroki, Yokohama, and Masakuni Kawasaki, Ichinomiya, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Aug. 13, 1973, Ser. No. 387,819

Claims priority, application Japan, Aug. 12, 1972, 47-80885

Int. Cl.² B41M *5/02*

U.S. Cl. 428—200 **8 Claims**

1. A heat printing sheet, which comprises:

a substrate having coated thereon, a heat transferable composition in the form of characteristic marks or figures, said composition comprising 10 – 60 % by weight of at least one tackifier selected from the group consisting of terpene resins, hydrogenated cyclopentadiene resins, cumarone-indene resins, phenol resins, styrene-olefin copolymers, α-methylstyrene-vinyltoluene copolymers, rosins, polyol esters, hydrogenated rosin-polyol esters; 5 – 50% by weight of at least one wax selected from the group consisting of plant wax, petroleum wax, coal wax, synthetic wax; 10 – 60% by weight of an ethylene-vinyl acetate copolymer which contains 5 – 50% by weight of a vinylacetate component and which has a melt index of 4 – 1000 g/10 min; 5 – 40% by weight of a filler which is blendable with said tackifier, wax or ethylene-vinylacetate copolymer; and a pigment.

3,944,696

HIGH-ADHESION CONDUCTORS

John Robert Larry, Youngstown, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 404,796, Oct. 9, 1973, Pat. No. 3,896,054, which is a continuation-in-part of Ser. No. 231,375, March 2, 1972, abandoned. This application Feb. 18, 1975, Ser. No. 550,618

Int. Cl.² C03C *3/10;* **B32B** *17/06, 3/00, 7/14*

U.S. Cl. 428—208 **6 Claims**

1. In electrical conductor patterns of silver or palladium silver particles plus inorganic binder therefor, adherent to a ceramic substrate, conductor patterns of improved soldering characteristics and improved adhesion to the substrate, wherein said inorganic binder is a glass consisting essentially of, by weight,

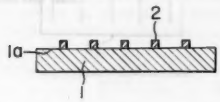
5-22% PbO
1-5% CaO
0.7-3% Al_2O_3
0.7-2.5% B_2O_3
5-20% SiO_2 and
50-85% Bi_2O_3

3,944,697

GLASS BODY HAVING A FLUORESCENT PATTERN INWARDLY OF A SURFACE THEREOF

Takeo Ichimura, and Teruo Kaneko, both of Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed May 9, 1973, Ser. No. 358,467
Int. Cl.² C03C 17/00; C09K 9/00
U.S. Cl. 428—210 9 Claims



1. A normally transparent glass body which exhibits fluorescence in a desired pattern inwardly of a surface thereof when subjected to ultraviolet radiations, which consists essentially of a fluorescent silicate glass containing ions for providing a fluorescent center, alkali metal ions which are ion-exchangeable and

ions for providing an extinction center present in said glass body in areas other than those of said desired pattern and extinguish the fluorescent properties of said ions for providing a fluorescent center,

said ions for providing an extinction center having been penetrated into said glass body from said surface through ion-exchange with said alkali metal ions, whereby, when subjected to ultraviolet radiations said glass body exhibits fluorescence in a desired pattern in those areas not containing said other ions.

3,944,698

GYPSUM WALLBOARD AND PROCESS FOR MAKING SAME

Robert P. Dierks, and Robert J. Rillie, both of Des Plaines, Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Nov. 14, 1973, Ser. No. 415,669
Int. Cl.² B32B 3/18
U.S. Cl. 428—219 14 Claims

1. In a gypsum board having a set gypsum core securely bonded to paper cover sheets; the improvement comprising a plurality of glass reinforcing fibers in the gypsum core wherein a majority of said fibers are disposed immediately adjacent the interface of the core and at least one of the cover sheets, said fibers being of an average length sufficiently great so that they are frictionally gripped by the core with such force that said fibers will break off rather than pull out of the core when said fibers are subjected to external tension, and being bonded to the cover sheet.

3,944,699

OPAQUE MOLECULARLY ORIENTED AND HEAT SET LINEAR POLYESTER FILM AND PROCESS FOR MAKING SAME

Carl Fraser Mathews; Christopher Deverell, both of Hitchin; Gordon Edmund Alfred Pears, Harpenden, and Peter George Knowles, Luton, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 19, 1973, Ser. No. 407,951
Claims priority, application United Kingdom, Oct. 24, 1972, 48931/72
Int. Cl.² C08G 39/10; B32B 27/08
U.S. Cl. 428—220 12 Claims

1. A process for the production of an opaque molecularly oriented and heat set linear polyester film, which comprises forming a loosely blended mixture of particles of a linear polyester produced by condensing at least one dicarboxylic acid, a lower alkyl diester thereof or bis-p-carboxyphenoxyethane with at least one glycol with from 3 to 27% by weight of particles of a homopolymer of ethylene or propylene, there being no intimate bond between the polyester and homopolymer, extruding the blended mixture as a film, quenching and biaxially orienting the film by stretching it in mutually perpendicular directions, and heat setting the film.

3,944,700

METHOD OF MANUFACTURING POLYAMIDE COATED TEXTILE MATERIAL AND TO THE TEXTILE MATERIAL MADE ACCORDING TO THE METHOD

Wilhelmus L. R. Mumbers, Waalwijk, Netherlands, assignor to L. Mombers B.V., Waalwijk, Netherlands

Filed Apr. 19, 1974, Ser. No. 462,576
Claims priority, application Netherlands, June 22, 1973, 7308704
Int. Cl.² B32B 27/12; B05D 3/10; B32B 27/34
U.S. Cl. 428—260 4 Claims

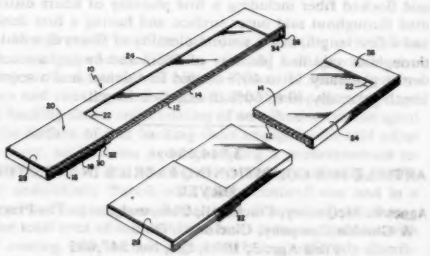
1. In a method of manufacturing polyamide coated textile material in which a cohesive basic layer, comprising textile fibers of random types, is treated with a solution of a polyamide and a plasticizer in formic acid and whereafter the polyamide is precipitated by contact with a water coagulation bath, the improvement wherein benzene sulphonic acid n-butylamide is employed as said plasticizer and said formic acid is the only solvent present in said solution.

3,944,701

PHOTOGRAPHIC FILM UNIT HAVING GRAVURE COATED, TAPERED THICKNESS LAYER

John J. Dennis, Jr., Watertown, and Thomas P. McCole, South Natick, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 6, 1972, Ser. No. 303,685
Int. Cl.² B05D 5/00
U.S. Cl. 427—288 17 Claims



1. In the method of manufacturing a photographic film assemblage including:

a. a pair of dimensionally stable elements in face-to-face contact having at least an image area therebetween;
b. a sheet-like support adjacent one of said elements; and
c. at least a pair of elongated spacing layers each formed by applying to said sheet-like support at least a coating, tapered in thickness, of a pigment-containing liquid coating composition so that said spacing layers taper in thickness from a maximum near the leading end of said image area to a minimum near the trailing end of said image area, said supported spacing layers forming a spacing element which is adhered to at least one of said dimensionally stable elements at the lateral margins of said image area;

said assemblage adapted to be processed by a viscous liquid processing agent distributed between said dimensionally stable elements in a layer at least coextensive with said image area;

the improvement comprising preparing said spacing layers by doctoring said liquid into the cells of a gravure roller varying in depth according to the taper desired; pressing said gravure roller into contact with said support to transfer said liquid thereto; and drying said liquid to a solid state to form a tapered thickness coating.

11. In a method of manufacturing a photographic film unit comprising two substantially rectangular sheet-like elements secured in face-to-face relation by a binding sheet which is formed with a rectangular opening defining an image area and includes lateral, leading and trailing end sections surrounding said opening, said binding sheet adhered to the surface of one of said elements with at least part of said lateral sections of said binding sheet folded around the lateral edges of both said elements and adhered to the margins of the second of said elements;

the improvement comprising the steps of forming said binding sheet tapered in thickness at least at its lateral sections from a maximum near the leading end of the opening therein to a minimum at the trailing end of the opening by:

forming a gravure roller having at least a first region with cells of a uniform maximum depth and an adjacent second region having cells tapering from said maximum depth to a minimum depth;

doctoring a liquid containing a pigment into said cells;

pressing said gravure roller into engagement with a support sheet to transfer said liquid from said roller to said support sheet;

drying said liquid to form a solid, pigment-containing coating including a first area of substantially uniform maximum thickness and a second area tapering from said maximum thickness at said first area to a minimum thickness; and

forming a rectangular opening in said second area.

3,944,702

FIBROUS STRUCTURES BONDED WITH A SILSESQUIOXANE-CONTAINING COMPOSITION

Harold A. Clark, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed June 24, 1974, Ser. No. 482,298
Int. Cl.² D04H *1/58*
U.S. Cl. 428—288 **14 Claims**

1. A coherent three-dimensional structure comprising a plurality of contiguous fibers, said fibers being bonded at their points of contact with a composition consisting essentially of 10 to 75 weight percent colloidal silica uniformly dispersed in a matrix of 25 to 90 weight $RSiO_{3/2}$ in which R is selected from the group consisting of alkyl radicals of 1 to 3 inclusive carbon atoms, the vinyl radical, the 3,3,3-trifluoropropyl radical, the gamma-glycidoxypropyl radical and the gamma-methacryloxypropyl radical, at least 70 weight percent of the matrix being $CH_3SiO_{3/2}$.

3,944,703

FIBROUS BATTS IMPREGNATED WITH AQUEOUS DISPERSIONS BASED ON HEAT-HARDENABLE PHENOLIC RESINS

James Harding, Green Brook, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 466,790, May 3, 1974, abandoned, which is a division of Ser. No. 239,316, March 29, 1974, Pat. No. 3,823,103, which is a continuation-in-part of Ser. No. 164,819, July 21, 1971, abandoned. This application Feb. 20, 1975, Ser. No. 551,237
Int. Cl.² B32B *17/02*; C08G *51/18*
U.S. Cl. 428—288 **5 Claims**

1. Organic or inorganic fibers bonded by the cured product of an aqueous dispersion containing dispersed particles of a heat-hardening resole phenolic resin in water and containing gum arabic and at least one of the following gums: a polysaccharide consisting essentially of mannose and galactose units, a polysaccharide consisting essentially of D-mannuronic and L-guluronic acid units, and gum carageenan,

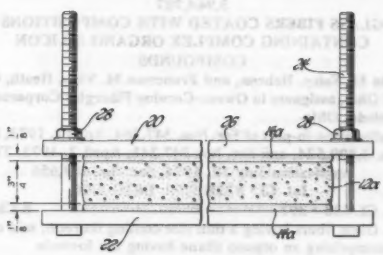
wherein the combined weight of the recited gums is about 0.5 to about 12 parts by weight per 100 parts by weight phenol used in producing the phenolic resin, and the weight ratio of the gum arabic to the other recited gum is about 0.5 to about 20 to 1, wherein said aqueous dispersion is stable for a period of time in excess of about two weeks, and wherein said aqueous dispersion is infinitely dilutable with water.

3,944,704

COMPOSITE STRUCTURE

Chauncey L. Dirks, Metamora, Mich., assignor to The John Z. DeLorean Corporation, Bloomfield Hills, Mich.

Filed Oct. 31, 1974, Ser. No. 519,496
Int. Cl.² B32B *3/26*
U.S. Cl. 428—305 **13 Claims**



1. A composite structure comprising a plurality of layers of initially resilient materials having open and connected cells, at least two of said layers having substantially different initial compressive resistances, a layer of high strength filaments overlaying the open-cell layer of lesser compressive resistance, a thermosetting resinous material impregnating the open-cell layers, said resinous material having been cured while maintaining the layers of resilient material and high strength filaments under compression whereby the cured resinous material is disposed as a continuous and rigid phase, throughout all of said layers.

3,944,705

ELECTROSTATIC RECORDING MATERIAL AND MANUFACTURE THEREOF

Hironari Fujioka, Takatsuki; Takao Matsushita, Kobe, and Taiji Higaki, Nishinomiya, all of Japan, assignors to Kanzaki Paper Manufacturing Company, Ltd., Tokyo, Japan

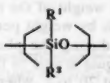
Filed May 20, 1974, Ser. No. 471,655

Claims priority, application Japan, July 26, 1973, 48-84624; July 26, 1973, 48-84625; Aug. 23, 1973, 48-94726

Int. Cl.² B32B 9/04, 5/16

U.S. Cl. 428—331 12 Claims

1. In an electrostatic recording material consisting essentially of an electroconductive base sheet and a dielectric layer of organic polymer materials supported thereon, the electrostatic recording materials being characterized in that the dielectric layer contains 10 to 70 wt. % of non-conductive and non-photoconductive finely divided powder coated with organopolysiloxane having the organosiloxane units represented by the formula of



wherein R^1 is an organo group and R^2 is an organo group, hydrogen atom, hydroxyl or halogen atom.

3,944,706

SELF-BONDING POLYETHYLENE TRIMELLITATE IMIDE VARNISH

Thomas S. Czajka, Wheaton, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Aug. 1, 1974, Ser. No. 493,558

Int. Cl.² H01B 3/30; C08G 73/10

U.S. Cl. 428—383 7 Claims

1. Magnet wire bearing a continuous self-bonding varnish top coat comprising a poly(ethylenetrimellitate imide) having an inherent viscosity of at least 0.3 dl/g.

3,944,707

GLASS FIBERS COATED WITH COMPOSITIONS CONTAINING COMPLEX ORGANO SILICON COMPOUNDS

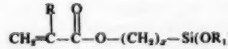
Kevin M. Foley, Hebron, and Francesco M. Vigo, Heath, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. Nos. 347,264, April 2, 1973, Pat. No. 3,899,524, and Ser. No. 347,241, April 2, 1973. This application July 18, 1974, Ser. No. 489,656

Int. Cl.² B32B 9/00; D02G 3/00

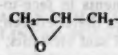
U.S. Cl. 428—391 8 Claims

1. Glass fibers having a thin size coating thereon, said coating comprising an organo silane having the formula



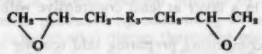
wherein R is hydrogen or methyl, x is an integer from 3 to 6, and R_1 is alkyl or hydrolysis products thereof, and an organo silicon compound prepared by reaction of (1) a halosilane selected from the group consisting of a tetrahalosilane and a halosilane of the formula

wherein R_7 is an organic group containing 1 to 20 carbon atoms, n is an integer from 1 to 2 and X is halogen, (2) a monoepoxide selected from the group consisting of an alkylene oxide, a functional epoxide having the formula



wherein R_3 is selected from the group consisting of aryl, alkyl, alkenyl and a group having the formula

where R' is hydrogen or methyl, and combinations thereof, and (3) a diepoxide selected from the group consisting of an epoxide of the formula



wherein R_3 is a divalent organic group and a cycloalkane diepoxide, with (2) being reacted in a ratio of 1 to 3 epoxide equivalents per mole of (1) and (3) being reacted in a ratio of 0.5 to 3 epoxide equivalents per mole of (1).

3,944,708

SYNTHETIC FIBERS AND PROCESS FOR MAKING SAME

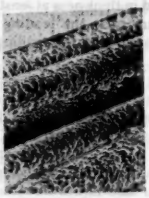
Victor Dumas, Sainte-Foy-les-Lyon, France, assignor to Rhone-Poulenc Textile, Paris, France

Filed Jan. 21, 1974, Ser. No. 434,993

Claims priority, application France, Jan. 19, 1973, 73.02197

Int. Cl.² D01D 5/08; D02G 3/00

U.S. Cl. 428—400 4 Claims



1. Synthetic polymer filaments having a dull appearance and a feel similar to natural fibers, said filaments being selected from the group consisting of polyamide, polyester and polyolefin, and having an integral core-skin structure, said core of oriented dense polymer, and said skin of fibrous vesicular polymer having a thickness of about 2 to 6μ and having protuberances, vesicles and fibrilla.

3,944,709

SURFACE MODIFICATION BY ELECTRICAL DISCHARGE IN A MIXTURE OF GASES

Boris Levy, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 13, 1974, Ser. No. 469,435

Int. Cl.² B05D 3/06; B32B 33/00

U.S. Cl. 428—409 13 Claims

1. A method of modifying the surface properties of a substrate which comprises the steps of:

establishing in a reaction chamber a gaseous medium comprising a mixture of an oxide of carbon with either a lower alkane or ammonia each having a lower ionization potential than said oxide of carbon;

disposing at least a portion of said substrate in said chamber with at least one surface thereof contacting said medium; and

applying a voltage in the range from about 200 to 1000 volts across a pair of electrodes disposed in said chamber

under a partial vacuum of about 0.1 to about 10 mm Hg pressure so as to maintain a glow discharge in said medium,

said glow discharge being sufficient to induce a reaction between the components of said mixture thereby to provide a hydrophilic reaction product on the surface of said substrate which improves the wettability of said surface.

10. An article having deposited on at least one surface of a support a thin hydrophilic layer comprising the reaction product resulting from an electrical glow discharge conducted at a voltage in the range from about 200 to 1000 volts in a partial vacuum of about 0.1 to 10 mm Hg pressure in a gaseous atmosphere in contact with said surface, said atmosphere comprising a mixture of an oxide of carbon with either a lower alkane or ammonia each having a lower ionization potential than said oxide of carbon.

3,944,710

TRANSPARENCY

Richard A. Parent, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 1, 1974, Ser. No. 465,964

Int. Cl.[2] B32B *27/06, 27/36;* **G03G** *13/14*

U.S. Cl. 428—412 **3 Claims**

1. A transparency for the formation of an adherent electrostatic image thereon comprising a thermoplastic film sheet, said sheet having at least one surface coated with a long chain aliphatic hydrocarbon having a melting point of above 40°C., said coating having a thickness of above 0.1 mil.

3,944,711

TRANSPARENCY

Richard A. Parent, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 1, 1974, Ser. No. 465,965

Int. Cl.[2] B32B *27/06, 27/36;* **G03G** *13/14*

U.S. Cl. 428—412 **2 Claims**

1. A transparency for the formation of an adherent electrostatic image thereon comprising a thermoplastic film sheet, said sheet having at least one surface coated with a nonvolatile aliphatic amine compound selected from the group consisting of 1,8-diamino octane, n-octadecyl amine, n-dodecyl amine and mixtures thereof, said coating having a thickness of above 0.1 mil.

3,944,712

ZINC DUST-COATED STEEL LIGATURES

Joseph F. Kurcz, Summit, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Aug. 10, 1973, Ser. No. 387,328

Int. Cl.[2] C23C *1/00*

U.S. Cl. 428—418 **11 Claims**

1. A steel ligature having adherently coated thereon a thin and flexible film comprising from about 80 to about 96 weight percent of finely divided zinc particles and 4 to 20 weight percent of a binder material, said binder material comprising from about 8 to about 65 weight percent of a phenol-formaldehyde resin and from about 35 to about 92 weight percent of a low molecular weight epoxy resin.

3,944,713

METHOD AND APPARATUS FOR PRE-HEATING VITRIFIABLE BATCH

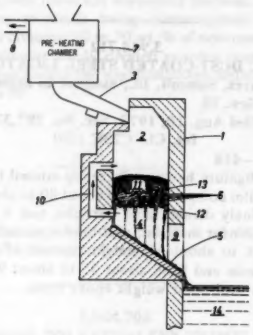
Emile Plumat, Gilly, and Jean-Pierre Mairesse, Ransart, both of Belgium, assignors to Glaverbel-Mecaniver, Watermael-Boitsfort, Belgium

Filed Aug. 29, 1974, Ser. No. 502,236

Claims priority, application Belgium, Sept. 5, 1973, 68363

Int. Cl.² C03B *1/00, 5/02*

U.S. Cl. 13—6 **30 Claims**



11. Apparatus for use in pre-heating a vitrifiable batch prior to its introduction into a glass-melting furnace, comprising a feed shaft into which vitrifiable batch can be fed and providing a flow path for hot gases escaping from such furnace, at least one support in said shaft for temporarily supporting batch material while heat is transferred to it from such hot gases, said support including a plurality of spaced bars and disposed so that its bottom side forms part of the boundary of the gas flow path and so that between such support and the inner surface of the shaft there is a gap via which such gases can flow upwardly past and in contact with such support.

3,944,714

ELECTROSLAG REMELTING PLANT

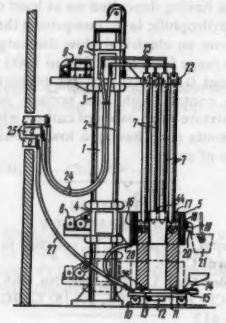
Jury Pavlovich Shtanko, ulitsa E. Potie 9, kv. 92; Vitaly Mikhailovich Baglai, ulitsa Semashko 10, kv. 54/3; Boris Izrailevich Medovar, bulvar Lesi Ukrainki 2, kv. 8; Leonid Mikhailovich Stupak, Brest-Litovskoe shosse, 39, kv. 9; Georgy Anatolievich Pavliichuk, ulitsa Erevanskaya 8, kv. 8, and Alexei Georgievich Bogachenko, ulitsa Miljutenko, 15/2, kv. 141, all of Kiev, U.S.S.R.

Continuation of Ser. No. 353,670, April 23, 1973, abandoned. This application Apr. 2, 1974, Ser. No. 457,184

Int. Cl.² H05B *3/60*

U.S. Cl. 13—9 ES **10 Claims**

1. An electroslag remelting plant comprising: a cooled mould; a base plate adapted for shaping the bottom part of an ingot; a means having a hole arranged near the mould wall for bottom pouring of molten slag into the bottom part of the mould; a means having a hole for tapping molten slag from the mould accommodated in the top portion of the mould; a means mounted in the mould wall for detecting the level of molten metal in the mould; a single-phase transformer having a secondary winding with a midpoint electrically connected to the base plate and the mould; two similar groups of electrodes; each one of the two groups of the electrodes comprising at least two electrodes disposed in the mould and connected to one of the ends of the secondary winding of the single phase transformer so that each two proximate adjacent electrodes have an opposite polarity; a means for holding the electrodes immovable relative to each other over the mould and for supplying electric current to the electrodes; a means for moving the means for holding the electrodes in a vertical and a



horizontal direction; a means for moving the mould in a vertical and a horizontal direction; and a means for moving the base plate in a horizontal direction.

3,944,715

INDUCTION CRUCIBLE FURNACE

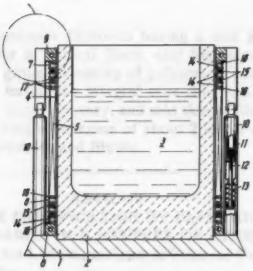
Fritz Hegewaldt, Herdecke; Horst Gillhaus, Dortmund-Loh, and Otto Erdman, Dortmund, all of Germany, assignors to Brown, Boveri & Cie Aktiengesellschaft, Mannheim, Germany

Filed Apr. 11, 1974, Ser. No. 460,184

Claims priority, application Germany, Apr. 11, 1973, 2318193

Int. Cl.² F27D *11/06*

U.S. Cl. 13—27 **5 Claims**



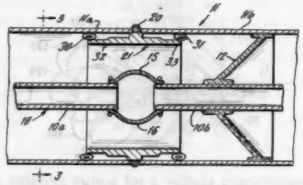
1. In an induction crucible furnace having a crucible surrounded by an induction coil member that is prestressed in axial direction by ring members disposed at opposite ends of the coil member and connected together by a plurality of tie rods extending parallel to the axis of the coil member and distributed uniformly about the periphery of the crucible, one of the ring members being fixed to a base frame of the furnace, the improvement therein comprising spacer means disposed between and separating the ring members and the coil member and having inner diameters matching at least one of the ring members, said spacer means comprising longitudinally slotted cylinders.

3,944,716

ELASTOMERIC CONTAMINATION SEAL

John W. Katzbeck, Greensburg, and James C. Cron, New Stanton, both of Pa., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Apr. 1, 1974, Ser. No. 456,901
Int. Cl.² H02G 15/24
U.S. Cl. 174—21 R 3 Claims



1. In combination, first and second compressible contamination seals, first and second discrete high-voltage gas-filled transmission line sections, and a backup welding ring;

said first and second high-voltage gas-filled transmission line sections each consisting of substantially identical axially aligned first and second outer housings which are cylindrical in cross-section, the ends of said first and second outer housings which face one another being spaced from one another, a weld bead connected between and joining said spaced ends of said first and second housings, an elongated central conductor suspended within said first and second outer housings; said central conductor being generally circular in cross-section, and a plurality of support insulators axially spaced from one another along the axis of said elongated central conductor and connected between said elongated central conductor and said first and second housings suspending said central conductor within said axially aligned first and second outer housings and in insulated relationship therewith;

said backup welding ring comprising a cylindrical ring having a relatively short axial length in comparison to the length of said first and second outer housings and having an enlarged central diameter region axially aligned with said spaced ends of said first and second housings and in contact with the inner diameter of said weld bead, and having first and second end portions which extend axially outward in opposite directions from said enlarged central diameter region and which are respectively disposed within the interior of said first and second housings and which are respectively adjacent said ends of said first and second housings; said first and second end portions of said backup welding ring having identical outer diameters which are radially spaced from the respective surrounding interior diameters of said first and second housings;

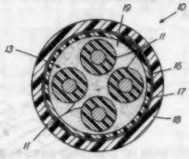
said first and second compressible contamination seals respectively secured to and surrounding said backup welding ring first and second end portions and being disposed in respective spaced planes which are perpendicular to the axis of said backup welding ring, and being compressed in the annular spaces between the inner surface of said first and second housings, respectively, and the opposing outer surfaces of said first and second end portions of said backup welding ring; said first and second compressible contamination seals each being axially spaced from said weld bead.

3,944,717

FLAME-RETARDANT, WATER-RESISTANT COMPOSITION AND COATING TRANSMISSION MEMBER THEREWITH

Joseph Michael Hacker, Fallston, Md.; Stanley Kaufman, Dunwoody, Md.; Raffaele Antonio Sabia, Atlanta; Earl Salvator Sauer, Atlanta, both of Ga.; Charles Edward Tidd, Jr., Baltimore, Md., and Raymond Walker, Decatur, Ga., assignors to Western Electric Company, Inc., New York, N.Y. and Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Aug. 15, 1973, Ser. No. 388,695
Int. Cl.² H02G 15/00
U.S. Cl. 174—23 C 9 Claims



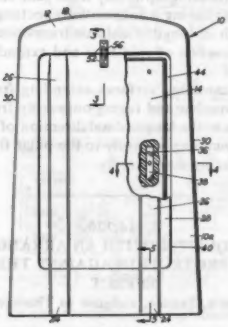
1. An elongated transmission member comprising a plurality of individually insulated conductors having a jacket formed thereover, the interstices formed between the conductors being filled substantially with a flame-retardant, water-resistant composition which comprises a polyvinyl chloride homopolymer, a chlorinated polyethylene, and a chlorinated paraffin where the polyvinyl chloride homopolymer, the chlorinated polyethylene and the chlorinated paraffin are present in an amount range from at least 85.5 parts by weight per 100 parts by weight of the composition.

3,944,718

ENCLOSURE FOR PAD MOUNTED EQUIPMENT

William L. Bright, 0605 SW. Curry St., Portland, Oreg. 97201

Filed June 19, 1974, Ser. No. 480,934
Int. Cl.² H05K 5/00
U.S. Cl. 174—50 9 Claims



1. An enclosure for electrical equipment of the type arranged to be seated on a ground supported pad, comprising

a. a housing having side walls, front and rear end walls, and a top wall, the bottom being open,

b. said housing being molded of dielectric material,

c. means on said housing arranged to secure it to a ground supported pad,

d. a door opening in one of said end walls,

e. an inturned flange on said end wall around said door opening having an arcuate extension projecting into the door opening with its concaved portion facing outwardly,

f. a door mounted in said opening in confined relation within said inturned flange,

g. and an inturned flange on said door extending into the concave portion of the arcuate extension of the inturned flange on said end wall whereby to prevent unauthorized persons from pushing a foreign object through the joint.

3,944,719

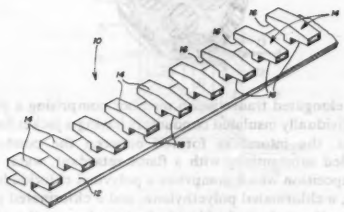
WIRE ROUTING APPARATUS

Ulyss Ray Rubey, Lewisville, Tex., assignor to United Wiring and Manufacturing Co., Garland, Tex.

Continuation-in-part of Ser. No. 318,589, Dec. 26, 1972, Pat. No. 3,825,999. This application Jan. 25, 1974, Ser. No. 436,533

Int. Cl.² H02B *9/00*; H05K *1/18*

U.S. Cl. 174—72 A **2 Claims**



1. Wire routing apparatus for mounting on a circuit board supporting interconnected electrical components, comprising:

a base having an elongated substantially rectangular configuration,

a plurality of substantially T-shaped fingers extending upwardly from said base and spaced thereon in a longitudinal direction, each of the plurality of fingers comprisng:

a. a pillar extending upwardly from said base,

b. a cross bar having a substantially rectangular configuration with its longitudinal axis transverse to the longitudinal direction of said base and extending from said pillar, and

c. opposed camming surfaces extending from said pillar to said cross bar and facing outwardly from said pillar transverse to the longitudinal direction of the base, said surfaces inclining inwardly to the pillar from said cross bar and facing downwardly.

3,944,720

SYSTEM EQUIPPED WITH AN ARRANGEMENT PROVIDING PROTECTION AGAINST THE CORONA EFFECT

Louis Tailler, Paris, France, assignor to Thomson-CSF, Paris, France

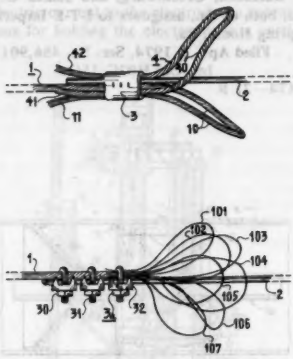
Filed Mar. 17, 1975, Ser. No. 558,693

Claims priority, application France, Mar. 19, 1974, 74.09211

Int. Cl.² H01T *19/02*

U.S. Cl. 174—73 R **3 Claims**

1. A system equipped with an arrangement providing protection against the Corona effect, said system comprising a conductor cable and an insulating cable, and fixing means connecting said cables together substantially in extension of each other, said arrangement comprising n loops of conductor elements (n being a positive integer) each of which is located substantially in a half-plane which, in relation to said insulating cable, makes an acute angle whose apex lies in said fixing means, said conductor cable passing twice, in reverse direc-



tions, through said fixing means so as to form at least one of said loops.

3,944,721

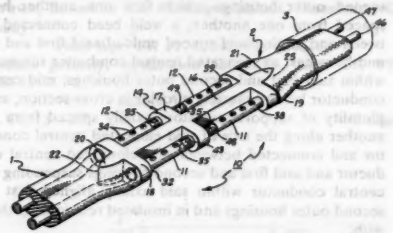
MULTICONDUCTOR WIRE SPLICE DEVICE

Larry R. Reeder, San Jose, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed July 16, 1974, Ser. No. 488,902

Int. Cl.² H02G *15/08*

U.S. Cl. 174—88 R **10 Claims**



1. A multiconductor wire splice device for splicing first and second wires so as to substantially equalize any tensile loading on the conductors of said first and second wires, each wire containing a plurality of conductors housed in insulation and being stripped to expose an insulation face and conductor ends, said splice device comprising, in combination:

a plurality of splice barrels, each splice barrel for receiving a conductor end of said first wire and a conductor end of said second wire and for providing an electrical connection and a rigid mechanical connection between said conductor ends;

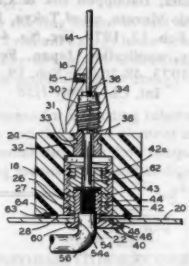
a frame supporting said splice barrels in spaced parallel relationship, said frame being rigid with respect to a predetermined level of tensile load to be applied to said wires, said frame being further defined as comprising an axial leg mounted intermediate said splice barrels and first and second transverse legs extending from said axial leg and supporting said splice barrels; and,

outer faces formed on said transverse legs on opposite ends of said frame for abutting the exposed insulation faces of said first and second wires respectively, said outer faces being further provided with at least one wedge member adapted for insertion between said conductors of said wires and extending outwardly from said frame.

3,944,722
ANTENNA MOUNT FOR VEHICLES

L. James Larsen, Vancouver, Wash., assignor to Larsen Electronics, Inc., Vancouver, Wash.

Filed Nov. 22, 1974, Ser. No. 526,148
Int. Cl.² H01Q 1/32
U.S. Cl. 174—153 A 7 Claims



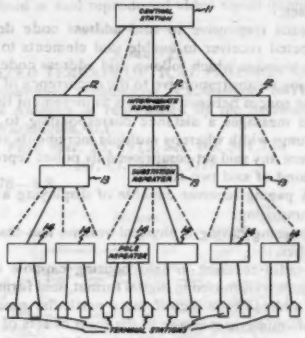
1. An antenna mount for a vehicle comprising:
an internally threaded insulator base adapted for mounting on the exterior of a vehicle body panel inculding antenna mounting means at an upper end portion of said base,
clamping means for securing said base to said body panel including an externally threaded clamp stud for threaded connection to said base above said panel and an integral thin oblong clamp flange extending laterally in opposite directions from a lower end of said stud for clamping engagement with the underside of said vehicle body panel, said flange having a maximum thickness dimension substantially less than its length and width dimensions,
said stud being joined to said flange at a position offset from the geometric center of said flange toward one end thereof so as to enable insertion of said flange portion through a small circular hole in said body panel of only slightly larger diameter than said stud and subsequent clamping of said flange against the underside of said body panel through progressive threading of said stud into said base,
said clamping means and said insulator base having a cable passage extending therethrough axially of said clamp stud and base for directing a coaxial lead-in conductor cable into said base and an inner conductor of said cable through said base to said antenna mounting means,
and means within said base for clamping an outer conductor of said cable to an upper end of said clamp stud within said base above said panel.

3,944,723
STATION FOR POWER LINE ACCESS DATA SYSTEM

Kouan Fong, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 5, 1974, Ser. No. 530,129
Int. Cl.² H04L 15/00
U.S. Cl. 178—3 13 Claims

1. A central station for a two-way communication system utilizing a power distribution network as the communication medium, said system comprising a plurality of multi-level, addressable repeaters, said central station comprising:
coupling means for coupling the central station to said power distribution network;
transceiver means coupled to said coupling means for transmitting and receiving signals between said central station and said two-way communication system;
teletypewriter buffer means for transferring information between said central station and a data processing computer;
decoding logic means coupled to said transceiver means for decoding tone code signals from said system;
data handling means coupled to said decoding logic means and said teletypewriter buffer means for monitoring data from said system and storing control information from a computer by way of said teletypewriter buffer means; and

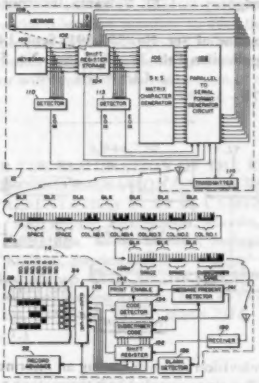


tone generating means coupled to said data handling means and said transceiver means for generating address selection tone codes, selecting a particular communication path through said network under the control of the information stored in said data handling means.

3,944,724
PAGING SYSTEM WITH SELECTIVELY ACTUABLE POCKET PRINTERS

Jack S. Kilby; Robert F. Schweitzer, and John McCrady, all of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 18, 1972, Ser. No. 254,668
Int. Cl.² H04L 21/00
U.S. Cl. 178—4.1 A 24 Claims



1. A system for communicating an alphanumeric message to a selected receiver unit comprising:
a. means for compiling and transmitting by radio successive multicharacter alphanumeric messages in dot matrix format, each preceded by selected unit address code, said means including means to transmit sets of sequential data pulses, each pulse representing one of two states, with predetermined time spaces between said sets where each set represents a dot matrix column for a character display,
b. a plurality of unitary portable units each having a housing and including a radio receiver means for receiving said address codes and said messages,

c. visual display means in each of said units each including a single column of elements for producing, column at a time, visible fractions of characters to be displayed in dot matrix form in response to receipt of each set of said pulses,

d. means responsive to said address code designating a selected receiver to enable said elements to respond to the message which follows said address code, and

e. timing means responsive to the occurrence of each of said time spaces between said sets to increment the display of said messages a distance corresponding to one matrix column width whereby multiple increments are produced where any said set comprises only pulses representing the second of said two states.

20. A paging receiver capable of displaying a visual message, comprising:

a. a housing having a physical volume less than ten cubic inches,

b. a radio receiver in said housing capable of receiving signals transmitted in digital format, said format including an address code identifying a particular receiver and an alphanumeric message in the form of sets of data pulses, each pulse being representative of the condition of a dot in the column of a matrix,

c. means to enable a visual display upon receipt of said address code,

d. means to energize said display in response to said message data sets,

e. means to index said display in response to the occurrence of blank time spaces after each message data set to present multiple character messages, and

f. battery means within said housing for energizing the system.

3,944,725

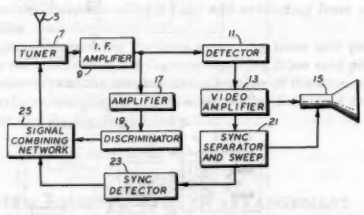
WIDE BAND AUTOMATIC FREQUENCY CONTROL CIRCUIT

Rangaswamy Arumugham, Batavia, N.Y.; William Frank Kruszewski, Belle Aire, Fla., and Karol Siwko, Batavia, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 397,591, Sept. 14, 1973. This application Feb. 28, 1975, Ser. No. 554,316

Int. Cl.² H04N 7/06

U.S. Cl. 178—5.8 AF **9 Claims**



1. In a television receiver having an intermediate frequency (IF) amplifier stage coupled to a tuner stage and by a detector stage to a video amplifier stage connected to a cathode ray tube, an automatic frequency control (AFC) circuit comprising:

discriminator means coupled to said IF amplifier stage for providing an error signal in response to signals deviating from the tuned frequency of said discriminator means;

means coupled to said video amplifier stage for detecting sync pulses; and

signal combining means coupling said discriminator means and said means for detecting sync pulses to said tuner stage for effecting a given "pull-in" range of said tuner stage in response to error signals from said discriminator means and an increased "pull-in" range in response to a signal from said means for detecting sync pulses indicative of the absence of detected sync pulses.

3,944,726

APPARATUS FOR MAKING PRINTING MASTERS

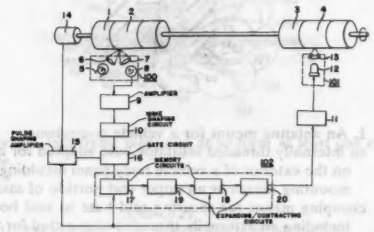
Shuji Ito, Takarazuka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha; Dainippon Ink & Chemicals, Incorporated and Yoshio Murata, all of Tokyo, Japan

Filed Feb. 12, 1974, Ser. No. 441,799

Claims priority, application Japan, Feb. 21, 1973, 48-20977; Feb. 20, 1973, 48-20352; Feb. 19, 1973, 48-19957

Int. Cl.² H04N 1/38

U.S. Cl. 178—6 **13 Claims**



1. A textile printing master making apparatus comprising:

a first and a second rotary cylinder to be rotated synchronously with each other;

a detecting system for scanning a cloth original wound on the first rotary cylinder to detect the necessary color light in terms of an electric signal;

a memory circuit for storing the detected electric signal;

an expanding/contracting circuit for adjusting the bleed allowance or the overlap allowance capable of generating an output signal expanded or contracted by a given time length based on the input signal to the memory circuit; and,

a reproducing system for exciting a recording object installed on the second rotary cylinder according to the output signal of the expanding/contracting circuit.

3,944,727

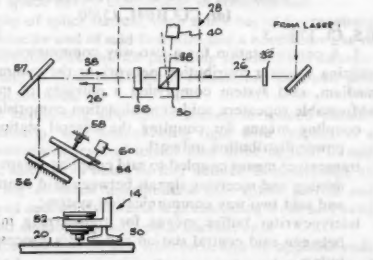
VIDEO DISC PLAYER WITH MOVABLE MIRROR FOR DIRECTING LIGHT BEAM ONTO REFLECTIVE DISC

James E. Elliott, Los Angeles, Calif., assignor to MCA Discovision, Inc., Universal City, Calif.

Division of Ser. No. 299,893, Oct. 24, 1972, Pat. No. 3,829,622. This application May 1, 1974, Ser. No. 465,823

Int. Cl.² G11B 21/10, 7/08; H04N 5/76

U.S. Cl. 178—6.6 R **5 Claims**



1. In a video disc playback system including a rotatable turntable adapted to carry a video disc, a player element, a turntable and a video disc carried thereby, an improved transducer system comprising:

a. optical system means, carried on the player element including an optical path having a first portion between the disc and a radiant energy source, a second portion for applying radiant energy to the disc and for returning radiant energy reflected from the disc and a third portion for applying returned radiant energy to an energy sensitive transducer;

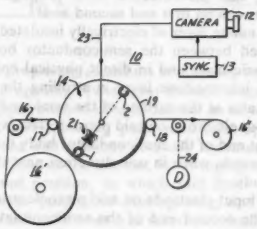
b. energy beam steering means in said second path portion for directing a radiant energy beam to a precisely selected location relative to a disc and for directing the reflected portion of the applied radiant energy beam to said third portion; and

c. translating means for imparting relative motion between the turntable and the player element at a predetermined rate in the radial direction for transporting said energy beam steering means in the radial direction relative to a disc.

3,944,728
VIDEO INFORMATION RECORDING AND REPRODUCTION

Leonard A. Ferrari, San Clemente, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Continuation-in-part of Ser. No. 293,713, Sept. 29, 1972, abandoned. This application Dec. 10, 1974, Ser. No. 531,408
Int. Cl.² H04N 5/78
U.S. Cl. 178—6.6 A **79 Claims**



1. In a method of recording video information on a recording medium having a multiply coiled recording track, and subsequently displaying said video information at a display scan rate, an improvement for reducing the size of the recording medium relative to a size requisite for a recording at said display scan rate, comprising in combination the steps of:

providing signals which include said video information in a series of video signal quanta synchronized at a scan rate lower than said display scan rate;

recording said signals including said video signal quanta on said recording medium at a first relative recording medium velocity and in accordance with the arithmetic progression

$$u = a + (n - l)d$$

wherein:

u denotes the numbers of the quanta which are recorded,

a and d are positive integers above zero, and

n is the order of any term in the progression,

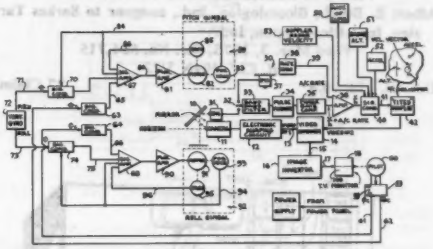
reproducing said recorded signals including said recorded video signal quanta in a reproducing operation at a second relative velocity being higher than said first velocity so that said reproduced video signal quanta are synchronized at said display scan rate; repeating in the same reproducing operation the reproduction of recorded video signal quanta at said second relative velocity, the repeated reproduction of any recorded video signal quantum in the same reproducing operation being completed before commencement of the reproduction of any recorded video signal quantum whose number in said arithmetic progression occurs more than one term after the number of the particular video signal quantum; and

displaying at said display scan rate the video information contained in said reproduced video signal quanta.

3,944,729
STABILIZED TERRAIN OPTICAL POSITION SENSOR

Christos Tsoubanos, Wanamassa, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 25, 1975, Ser. No. 561,724
Int. Cl.² H04N 7/18
U.S. Cl. 178—6.8 **9 Claims**



1. A system for displaying information to enable a helicopter to hover over a selected location, said system including an image camera having an effective viewing angle and mounted on said helicopter so that said viewing angle is substantially forward looking;

a mirror positionable within said viewing angle to reflect ground information to said camera when the helicopter is hovering;

means to stabilize said mirror against the pitch and roll of said helicopter;

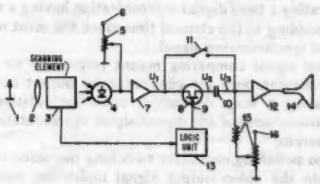
a television monitor mounted within the helicopter; and

means to transmit and invert the image from the image camera to the television monitor so that the image reflected from said mirror will appear in the bottom portion of said monitor screen and the images not reflected from said mirror will appear in the top portion of said monitor screen.

3,944,730
DEVICE FOR THE ELIMINATION OF THE EFFECT OF BACKGROUND RADIATION ON THE IMAGE REPRESENTATION IN AN IR-CAMERA

Jan Dahlqvist, Akersberga; Bo Matsson, Marsta, and Benny Johansson, Sollentuna, all of Sweden, assignors to AGA Aktiebolag, Lidingo, Sweden

Filed Mar. 5, 1974, Ser. No. 448,270
Claims priority, application Sweden, Mar. 6, 1973, 7303077
Int. Cl.² H01L 31/18; H04N 7/18
U.S. Cl. 178—7.1 **2 Claims**



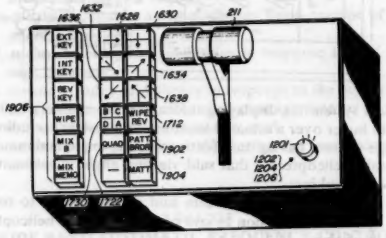
1. A device for the elimination of the effect of background radiation on the image representation in an IR-camera, which comprises scanning elements and a detector for the conversion of IR-radiation to a video signal, a-c coupling means for

coupling said video signal to an image representation unit, said video signal including an image signal and a background signal appearing periodically and separate from each other on said detector, switching means in the path of the video signal between said detector and said a-c coupling means therefor, said switching means being operative to open and close the signal path for the video signal periodically under control from said scanning element, whereby only the part of the video signal which contains said image signal is passed to said image representation unit.

3,944,731
VIDEO SPECIAL EFFECTS GENERATOR

Albert E. Busch, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed Mar. 3, 1975, Ser. No. 554,715
Int. Cl.² H04N 5/22
U.S. Cl. 178—6.8 **27 Claims**



1. A video special effects generator for controlling the combining of video input signals into a video output signal under the control of horizontal and vertical synchronizing signals, said generator comprising:

means for generating a series of first digital representations including a source of periodic signals, means for counting said periodic signals, means for generating a variable width signal, means for generating a fixed width signal and means operatively coupled to said variable width signal generating means and said fixed width signal generating means for rendering said counting means operative to count said periodic signals only upon the existence of a predetermined time relationship between said fixed and said variable width signals;

means responsive to horizontal synchronizing signals for generating a second digital representation having a value corresponding to the time elapsed since the most recent horizontal synchronizing signal;

means responsive to vertical synchronizing signals for generating a third digital representation having a value corresponding to the elapsed time since the most recent vertical synchronizing signal;

digital signal comparing means responsive to said digital representations for generating an output control signal having a state dependent upon the relative values of various ones of the digital signal representations applied thereto;

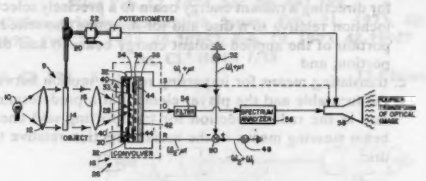
video switching means for switching the video input signals into the video output signal under the control of the output signal generated by the digital signal comparing means; and

means for altering the effect of various ones of said first, second and third signal representations on said output control signal to produce special effects controlled in accordance with said series of first digital representations.

3,944,732
METHOD AND APPARATUS FOR IMPROVING ACOUSTO-ELECTRIC SCANNING

Gordon S. Kino, Stanford, Calif., assignor to The Board of Trustees of the Leland Stanford University, Stanford, Calif.

Filed Feb. 12, 1975, Ser. No. 549,380
Int. Cl.² H04N 3/16, 3/00; H01V 7/00
U.S. Cl. 178—7.1 **37 Claims**



1. Apparatus for detecting the information present in the light from an optical image by acoustically scanning the charge carrier density perturbations in a semiconductor body, comprising:

a. a photosensitive semiconductor body that produces charge carrier density perturbations corresponding to the information in the light that impinges on the semiconductor body, said body having first and second ends;

b. a piezoelectric layer having first and second ends corresponding to the first and second ends of the semiconductor body, said piezoelectric layer propagates acoustic waves between its first and second ends;

c. an intermediate layer of electrically insulated solid material located between the semiconductor body and the piezoelectric layer and in direct physical contact therewith said intermediate layer controlling the number of surface states at the surface of the semiconductor body;

d. a first input electrode on said piezoelectric layer adjacent to the first end of the semiconductor body for generating a first acoustic wave in one direction past the semiconductor body;

e. a second input electrode on said piezoelectric layer adjacent to the second end of the semiconductor body for generating a second acoustic wave in an opposite direction past the semiconductor body, said first and second acoustic waves nonlinearly interact and scan the charge carrier density perturbations in the semiconductor body; and

f. output electrode means on said apparatus for obtaining electrical output signals corresponding to the charge carrier density perturbations in the semiconductor body, whereby the information present in the light is detected.

3,944,733
SIGNAL RECOGNITION APPARATUS

Fordyce E. Tuttle, 1017 N. Lake Way, Palm Beach, Fla. 33480

Continuation of Ser. No. 216,513, Jan. 10, 1972, which is a continuation of Ser. No. 859,612, Sept. 15, 1969. This application Feb. 14, 1974, Ser. No. 442,634
Int. Cl.² H01J 1/62, 29/89
U.S. Cl. 178—7.8 **1 Claim**

1. The method of optically enhancing signal recognition in the presence of noise in a visual display on a cathode ray oscillograph which comprises the steps of:

generating a visual display in a high contrast memory phosphor by a single sweep along the X-axis of said oscillo-

graph at a sweep rate which is very small compared to the real time change in the amplitude of a signal; and

modifying the light combining from the visual display such that the entire visual display appears uniformly bright when random noise alone is represented by the said display, whereby optical hard clipping of a non-random signal occurs at all levels.

3,944,734

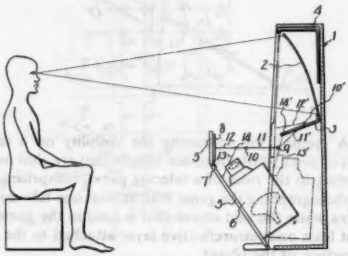
VIDEO PROJECTING SYSTEM

Yoshio Ogawa, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 23, 1974, Ser. No. 535,844

Int. Cl.² H04N *5/74, 5/645*

U.S. Cl. 178—7.91 **4 Claims**



1. A video projecting apparatus comprising an upright cabinet having an opening at the front thereof; a screen mounted within the upper portion of said cabinet so as to be viewable through the corresponding portion of said opening of the cabinet; a front wall member pivotally mounted, at its lower end, on said front of the cabinet for swinging movement between a closed position, in which said front wall member closes the lower portion of said opening, and an operative position, in which said front wall member is inclined upwardly and outwardly from said front of the cabinet for preventing the impingement on the screen of light that is reflected upwardly from in front of the front wall member; a projector mounted on said front wall member in back of the latter for projecting a video image upwardly and forwardly in respect to said screen when said front wall member is in said operative position; and a mirror mounted at the upper portion of said front wall member for reflecting said video image from said projector against said screen when said front wall member is in said operative position.

3,944,735

DIRECTIONAL ENHANCEMENT SYSTEM FOR QUADRAPHONIC DECODERS

Martin Edmund George Willcocks, Somersham, England, assignor to John C. Bogue, Santa Monica and Wesley Ruggles, Jr., Beverley Hills, both of, Calif.

Filed May 22, 1974, Ser. No. 472,291

Int. Cl.² H04R *5/00*

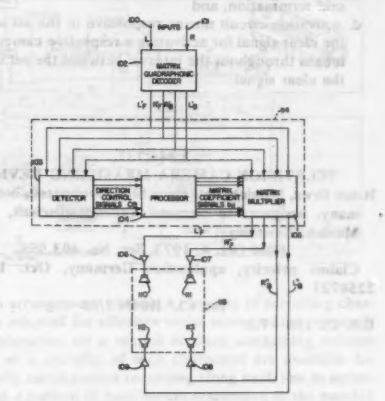
U.S. Cl. 179—1 GQ **33 Claims**

1. A system for enhancing the directional information content of a plurality of input signals containing directonal information to produce a plurality of output signals by means of a matrix multiplication process, comprising:

a. detector means for providing a plurality of direction control signals in response to said plurality of signals containing directional information;

b. processor means for receiving said plurality of direction control signals and for providing, in response to said received plurality of direction control signals, a plurality of coefficient signals, the value of each of said coefficient signals at any time being determined by the values of said plurality of direction control signals; and

c. matrix multiplication means for multiplying said plurality of input signals containing directional information by said plurality of coefficient signals, in accordance with the mathematical convention of multiplication of a vector by a matrix, to produce said plurality of output signals, the values of said plurality of coefficients being such that when said plurality of input signals is multiplied by said



plurality of coefficient signals to produce said plurality of output signals, the predominant directional information contained in said plurality of input signals is substantially removed from all output signals other than those in which said predominant directional information should appear while the total effective power in the output signals due to every component of directional information present in the input signals is simultaneously maintained substantially unchanged.

3,944,736

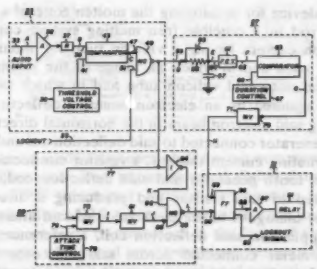
VOICE-OPERATED SWITCHING CIRCUIT FOR A VIDEO COMMUNICATIONS SYSTEM

Wayland L. Shepard, Liverpool, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed June 5, 1974, Ser. No. 476,431

Int. Cl.² H04M *3/56*

U.S. Cl. 179—1 VC **3 Claims**



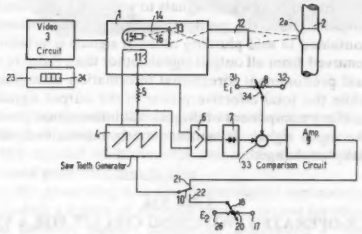
1. In a video communications system for remotely located conferees, a plurality of VOX circuits for controlling respective television cameras responsive to audio signals from respective speaking locations, each said VOX circuit including:

a. input audio level discriminator means for generating an output signal coincident with an input audio signal of equal or greater level than a selected threshold level;
b. attack time control means responsive to the output of the audio level discriminator means for generating a set signal when the duration of the output of the audio level discriminator means exceeds a predetermined amount;
c. audio duration control means responsive to the termination of the output of the audio level discriminator means for generating a clear signal delayed a selected time after said termination; and
d. activation circuit means responsive to the set signal and the clear signal for activating a respective camera control means throughout the interval between the set signal and the clear signal.

3,944,737
TELEVISION CAMERA MEASURING DEVICES

Heinz Drax, Munich, and Hans Stut, Grobenzell, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 4, 1973, Ser. No. 403,555
Claims priority, application Germany, Oct. 16, 1972, 2250721
Int. Cl.² H04N 3/16
U.S. Cl. 178—7.2 **2 Claims**

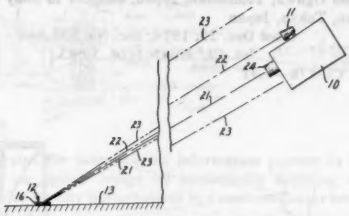


1. A device for monitoring the molten zone of a semi-conductor rod in a crucible free melting system comprising a television camera having a vidicon tube for monitoring the melting zone and in which an image of the melting zone is projected onto said vidicon tube and in which said vidicon tube is scanned by an electron beam, a deflection coil for scanning said electron beam in the horizontal direction, a saw tooth generator connected to said deflection col and providing an alternating current thereto, a resistor connected between said saw tooth generator and said deflection coil, a rectifier connected to said resistor and producing a direct current which is analogous to the peak value of said alternating current supplied to said deflection coil, a reference voltage, a potentiometer connected across said reference voltage, a comparison circuit having inputs connected to said rectifier and said potentiometer and supplying an output indicative of the difference in values of the inputs, and an amplitude adjusting means in said saw tooth generator which receives the output of said comparison circuit to control the amplitude of the alternating current output supplied to said deflection coil.

3,944,738
METHOD TO INCREASE THE VISIBILITY OF GAME OBJECTS DURING TELECASTING

James William Johnson, Marine-on-St. Croix, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 11, 1973, Ser. No. 423,699
Int. Cl.² H04N 5/38; A63B 67/00
U.S. Cl. 178—7.2 **4 Claims**

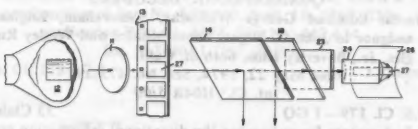


1. A method for enhancing the visibility on a television screen of small, difficult-to-see objects that are shot or thrown according to the rules of a telecast game, comprising:
1. photographing the game with at least one television camera while the said object that is used in the game carries at least one retroreflective layer attached to the exterior surface of the object;
2. projecting toward the game a light beam that is substantially parallel to, and no more than slightly spaced from, the optical axis of said television camera, so that the lens of the camera will be within the cone of light from the light beam that is retroreflected by the retroreflective layer carried on said object; and
3. telecasting the picture photographed by the camera; whereby there is a visible contrast between the image of the object and the image of the background for the object on the screen of television receivers that receive the telecast picture.

3,944,739
ELECTRO-OPTICAL SYSTEMS

Geoffrey Sword; John Leslie Lawrence; Stephen Richard Raggett, all of Fareham, and Bernard Blakemore, London, all of England, assignors to Colourvision Associates, London, England

Filed Feb. 8, 1974, Ser. No. 440,702
Claims priority, application United Kingdom, Feb. 9, 1973, 6425/73
Int. Cl.² H01J 29/89
U.S. Cl. 178—7.85 **2 Claims**

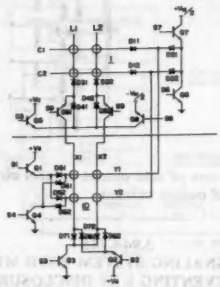


1. An electro-optical system comprising electronic scanning means for scanning an image bearing medium with a spot of light over a limited region; optical means for producing a distribution of light over a predetermined area; and electro-optical light sensing means having a photosensitive area corresponding to said predetermined area, said optical means producing substantially the same distribution of light over said photosensitive area for all positions of the spot of light in said limited region.

3,944,740
COORDINATE POSITION INFORMATION OUTPUT DEVICE

Kenji Murase, Kakogawa, and Shizuo Andoh, Kobe, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed July 22, 1974, Ser. No. 490,337
Claims priority, application Japan, July 31, 1973, 48-86174; July 31, 1973, 48-86175
Int. Cl.² G08C 21/00
U.S. Cl. 178—18 13 Claims



1. A coordinate position information output apparatus comprising:

a. a coordinate position indicating plate having a plurality of row electrodes and a plurality of column electrodes intersectingly disposed thereon defining intersection points, and an impedance element located at each intersection point of said electrodes;

b. an external address means for addressing selected intersection points and thereby reducing the impedance and establishing a current path between corresponding electrodes;

c. a plurality of unidirectional conducting elements each having a relatively long charge storage time and respectively connected to a corresponding one of row and column electrodes to provide a unidirectional current conducting path to each of said intersecting points;

d. a first circuit means for applying a forward voltage to said unidirectional conducting elements causing charge to be stored and a forward current to flow in said unidirectional conducting elements corresponding to addressed intersecting points of said plate;

e. second circuit means for applying a reverse voltage to said unidirectional conducting elements substantially immediately after the termination of said forward voltage, causing reverse current to flow in said unidirectional conducting elements connected to said electrodes corresponding to addressed intersecting points; and

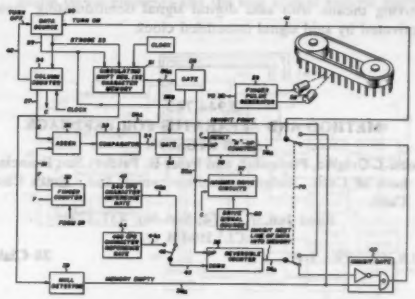
f. a matrix display device including a plurality of input conductors each corresponding to a respective one of said row and column electrodes, each of said input conductors being connected to respective ones of said unidirectional conducting elements;

whereby coordinate display information is supplied to said matrix display device by said input conductors as said reverse current flows in said unidirectional conducting elements in proportion to the charge stored therein.

3,944,741
PRINT RATE CONTROL SYSTEM

Samuel C. Harris, Jr., and Clifford M. Jones, both of Waynesboro, Va., assignors to General Electric Company, Waynesboro, Va.

Filed Sept. 17, 1974, Ser. No. 506,908
Int. Cl.² H04L 1/00
U.S. Cl. 178—23 R 16 Claims



1. In an arrangement wherein a plurality of recording characters are adapted for effective serial movement across each line in succession on a record medium containing column locations ad a plurality of such characters are available for substantially simultaneous recording along each line in accordance with a pattern of data, means responsive to the number of such characters to be substantially simultaneously recorded during each columnar alignment of said characters to provide a control signal when said number reaches a limit N, where N represents less than the maximum number of aligned characters which could be printed during such alignment, and means responsive to said control signal for limiting recording of characters within each such alignment to a number which is a function of the value of N.

3,944,742
BURST FREQUENCY SHIFT KEYING DATA COMMUNICATION SYSTEM

Paul M. Cunningham, Richardson, Tex., assignor to Spectradyne, Inc., Richardson, Tex.

Filed Apr. 1, 1974, Ser. No. 457,087
Int. Cl.² H04L 27/10; H04B 3/50
U.S. Cl. 178—66 R 15 Claims

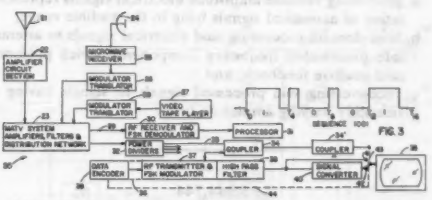


FIG. 3

1. In a burst-mode frequency shift keying communications system utilizing one way transmission of digital data from a plurality of RF transmitter stations to common receiving means; a plurality of RF transmitter stations each capable of generating short burst transmissions in the form of a plurality of bit elements with signal level transitions between different logic levels with the bit element signal level transition leading edges being an imbedded clock sensed by receiver means, and with the short burst transmissions being of short time duration relative to repetition time periods between short burst transmissions from an RF transmitter station; common receiving means for receiving burst-mode frequency shift keying modu-

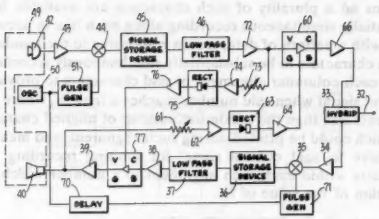
lated RF signals transmitted through an RF signal transmission media from said RF transmitter stations to said common receiving means; gating means for short burst transmissions for each of said RF transmitter stations; for each transmitter station repetition period gate activating means for activating said gating means associated with said corresponding RF transmitter stations for short burst transmissions; digital signal demodulating means in said common receiving means; and signal imbedded clock detecting means in said common receiving means with said digital signal demodulating means activated by said signal imbedded clock.

3,944,743

METHOD AND APPARATUS FOR FEEDBACK SUPPRESSION

John J. Criglar, Piedmont, and Peter R. Pettler, San Francisco, both of Calif., assignors to Plantronics, Inc., Santa Clara, Calif.

Filed Jan. 7, 1974, Ser. No. 431,173
Int. Cl.² H04M *1/20*
U.S. Cl. 179—1 FS **26 Claims**



1. A method for suppressing positive feedback in a sound amplifying system, said method comprising the steps of:

a. generating variable amplitude electrical signals representative of acoustical signals lying in the audible range;

b. time domain processing said electrical signals to attenuate preselected frequency components which promote said positive feedback; and

c. reconverting said processed signals to signals having a smoothly varying amplitude form.

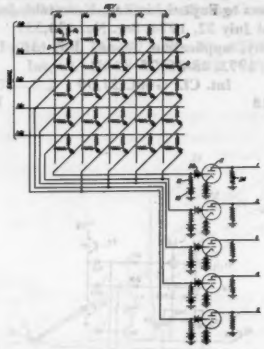
3,944,744

MATRIX CODING SECRET SIGNALLING SYSTEM

Danforth K. Gannett, Mountain Lakes, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 10, 1945, Ser. No. 592,962
Int. Cl.² H04K *1/02*
U.S. Cl. 179—1.5 R **8 Claims**

1. In a scrambling system for translating input message values into output currents of substantially random occurrence of values, separate message input circuits for each message value, separate outputs control circuits for determining each output current value, a plurality of key circuits crossing said message input circuits, means to apply key currents to respective key circuits on a substantially random basis, and means at each cross-over point between said message input circuits and key circuits for setting up a current condition in



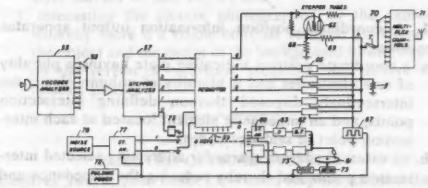
a corresponding one of said output control circuits to determine the value of output current.

3,944,745

SECRET SIGNALING SYSTEM WITH MEANS FOR PREVENTING KEY DISCLOSURE

Danforth K. Gannett, Mountain Lakes, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 10, 1945, Ser. No. 592,963
Int. Cl.² H04K *1/02*
U.S. Cl. 179—1.5 R **14 Claims**



1. In a signaling system for transmitting with secrecy signals of varying amplitude, means to encipher said signals comprising means to produce variable key currents and means to combine said signals with said key currents to produce for transmission combination signal and key currents, and means to modify the variable key current that is sent whenever the signal has zero value.

3,944,746

COLLECTING SWITCHING SYSTEM CALL DATA

Thomas Victor Burns, and Donald Ray Shea, both of Columbus, Ohio, assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

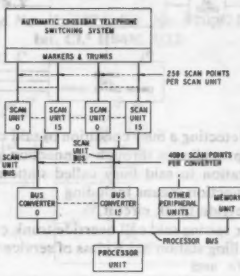
Filed Feb. 24, 1975, Ser. No. 552,433
Int. Cl.² H04M *15/10*
U.S. Cl. 179—7.1 R **20 Claims**

1. An arrangement for collecting call connection data from a common control circuit of a common control switching system wherein the common control circuit (1) assumes a busy control status when seized for the purpose of performing control functions associated with establishing a call connection between calling and called circuits, (2) assumes other control statuses while performing the control functions, (3) assumes an idle control status when released after performing

the control functions, and (4) includes registration therein of certain call connection data incident to assumption of certain control statuses, the arrangement comprising

A. a plurality of status word scan terminals for receiving from a plurality of circuit parts of the common control circuit a simultaneously existing plurality of binary status signals representing in signal content as a plural bit binary status word the control status of the common control circuit;

B. data word scan terminals for receiving from corresponding circuit parts of the common control circuit corresponding binary data signals representing in signal content as plural bit binary data words corresponding call connection data registered in the common control circuit;



C. and, signal processing means comprising

1. means for repeatedly scanning the status word scan terminals at least as fast as any change can occur in the signal content of the status word,
2. means controlled by the status word scanning means for detecting each change in the signal content of the status word,
3. data control means effective when enabled for scanning data word scan terminals and for storing the signal content of scanned data words,
4. and means controlled by the detecting means for enabling the data control means only if the signal contents of a succession of changed status words represent a prescribed succession of control statuses.

3,944,747

MULTIPLE CHANNEL FM STEREO SYSTEM

Carl G. Eilers, Oak Park, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 283,464, Aug. 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 190,008, Oct. 18, 1971, abandoned. This application Sept. 28, 1973, Ser. No. 401,926

Int. Cl.² H04H *5/00*

U.S. Cl. 179—15 BT **24 Claims**

7. Apparatus for accepting four input audio signals individually representative of first, second, third and fourth audio sources located, respectively, at the left-front, right-front, left-rear and right-rear of a listening point and characterizing an acoustic image and an SCA signal and for developing from said audio signals a composite four-channel stereo signal which is compatible with monaural and two-channel stereo receivers and which includes an SCA channel, said apparatus comprising:

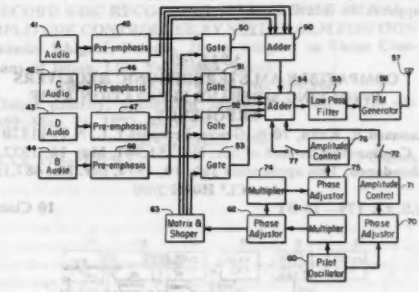
encoding means for combining said four input audio signals to develop a stereo signal effectively including in the frequency domain at least the following components;

a four-element sum component representing the sum of said four input audio signals,

a first two-element difference component representing a difference between the elements of a diagonally related first pair of said input audio signals modulating a first sub-carrier of angular frequency ω_s,

a second two-element difference component representing a difference between the elements of a diagonally related second pair of said input audio signals modulating a second sub-carrier of frequency ω_s but displaced in phase, relative to the phase of said first sub-carrier, by 90°,

and a four-element diagonal difference component representing a difference between the sum of said first pair of audio signal elements and the sum of said second pair of



audio signal elements single sideband modulating a third sub-carrier of angular frequency $2\omega_s$;

means for developing an SCA signal modulating a fourth sub-carrier of angular frequency ω_{sca} located in the spectrum space of the missing sideband of said third sub-carrier; and

means for developing a pilot signal having an angular frequency $\omega_s/2$ and a phase which is such that the phase of the second harmonic thereof is effectively displaced in phase relative to the phase of said first sub-carrier, by 45°.

3,944,748

MEANS AND METHOD OF REDUCING INTERFERENCE IN MULTI-CHANNEL REPRODUCTION OF SOUNDS

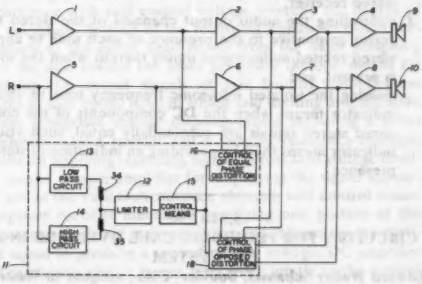
Hans-Robert Kuhn, Kiel, Germany, assignor to Electroacustic GmbH, Kiel, Germany

Filed Oct. 31, 1973, Ser. No. 411,278

Claims priority, application Germany, Nov. 2, 1972, 2253696

Int. Cl.² H04H *5/00*

U.S. Cl. 179—15 BT **8 Claims**



1. Method of suppressing interference voltages in multichannel reproduction of acoustic sounds in systems having at least two different channels by reducing the channel separation, comprising the steps of, deriving control voltages from and proportional to low and high frequency interference voltages, respectively, which occur in one of said channels, and

utilizing said control voltages to control the channel separation in both a phase-opposite sense and in an equal phase sense to thereby suppress the interference.

2. A method of suppressing interference voltages in multichannel reproduction of acoustic sounds in systems having at least two different channels by reducing the channel separation, comprising the steps of, separately deriving control voltages from and proportional to the low and high frequency interference voltages from a single one of said channels, combining the separately derived control voltages to produce a control signal, and utilizing said control signal to control the channel separation in a dual phase-opposite sense to thereby suppress the interference.

3,944,749

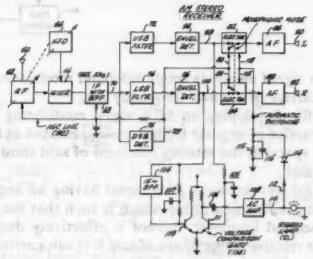
COMPATIBLE AM STEREOPHONIC RECEIVERS INVOLVING SIDEBAND SEPARATION AT IF FREQUENCY

Leonard R. Kahn, 70 N. Grove, Freeport L.I., N.Y. 11520

Continuation-in-part of Ser. No. 251,947, May 10, 1972, abandoned. This application July 10, 1974, Ser. No. 487,154

Int. Cl.² H04H *5/00*

U.S. Cl. 179—15 BT **10 Claims**



1. The method of indicating stereo signal presence in a stereo receiver and utilizing such stereo signal indication to control receiver audio output mode, comprising:

a. modulating an infrasonic frequency tone on a carrier wave modulated by stereo related audio signals,

b. transmitting the carrier wave thus modulated,

c. separately detecting the stereo related audio signals in the receiver,

d. comparing the DC components of the detected stereo signals,

e. demodulating out such infrasonic frequency tone in the stereo receiver,

f. controlling the audio output channels of the stereo receiver responsive to the presence of such tone to apply stereo related audio signal inputs thereto when the tone is present, and

g. passing the isolated infrasonic frequency tone to visual indicator means when the DC components of the compared stereo signals are substantially equal, such visual indicator means thereby providing an indication of stereo presence.

3,944,750

CIRCUITRY FOR PROVIDING CALL OVERRIDE IN A PBX SYSTEM

Edward Walter Sobanski, Boulder, Colo., assignor to Western Electric Company, New York, N.Y.

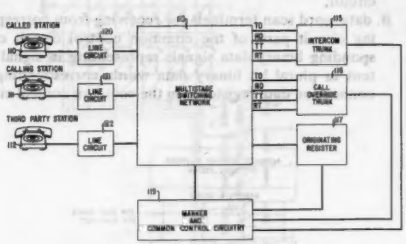
Filed Oct. 3, 1974, Ser. No. 511,752

Int. Cl.² H04M *3/20*

U.S. Cl. 179—18 BH **13 Claims**

1. In a telephone switching system having a plurality of line circuits terminated in station sets, said line circuits being interconnectable to a plurality of trunk circuits through a multistage switching network, the invention comprising call override circuitry for completing a connection between a calling station and a called station said called station being busy as a result of a connection to a third station, said call override circuitry comprising

means for determining a class of service provided to said calling station,



means for detecting a busy condition of said called station,

means for providing a through connection path from said calling station to said busy called station, said through path connection means including

a call override trunk circuit,

means for seizing said call override trunk circuit provided said calling station has a class of service permitting call override, and

means for enabling said call override trunk circuit in response to a switchhook flash from said calling station.

3,944,751

TELEPHONE PRIVATE BRANCH EXCHANGE SYSTEM

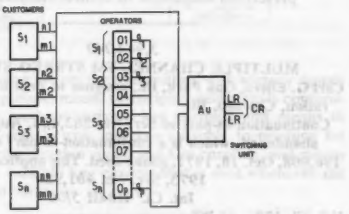
Pierre Morgand, Morsang-sur-Orge, and Yves Riou, Paris, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed June 18, 1973, Ser. No. 370,695

Claims priority, application France, June 16, 1972, 72.21890

Int. Cl.² H04Q *3/58*

U.S. Cl. 179—27 CA **7 Claims**



1. In a private branch exchange providing a multi-stage connecting network between private subscribers and for providing connection of at least a portion of the private subscribers with a public communication system including a central office by direct connection with the central office or connection thereto by means of operators, the private subscribers being associated with one or several enterprises located in the same general area, the automatic switching unit including processing means for determining the connection path to be provided through said connecting network means and register-sender means, the improvement comprising incoming and outgoing trunk means for connecting a subscriber with said central office, the incoming and outgoing trunk means being connected with a switching stage of the connecting network via two different paths, one of the paths providing a path for

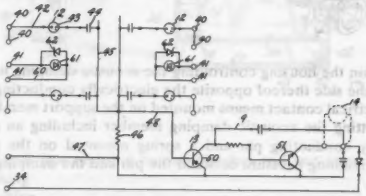
utilization by a first subscriber requesting communication with said central office, the other path providing a path for utilization by a second subscriber on a call back by the first subscriber, the incoming and outgoing trunk means further being connected with said register-sender means via a first line selector means connecting the incoming and outgoing trunk means to a first register means for registering the call back number of the second subscriber to assure the connection of the station of the first subscriber to the station of the second subscriber.

3,944,752

TELEPHONE LINE STATUS INDICATOR

Theodore Stearn, Flushing, and Paul V. De Luca, Port Washington, both of N.Y., assignors to Porta Systems Corporation, Syosset, N.Y.

Filed Nov. 1, 1974, Ser. No. 520,021
Int. Cl.² H04M 3/22
U.S. Cl. 179—81 C 4 Claims



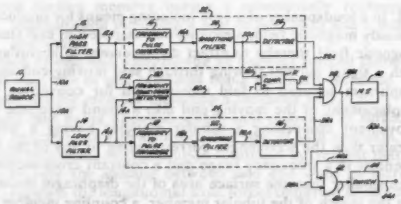
1. An improved telephone line status indicator adapted to be connected to the tip and ring circuits of a telephone line to indicate the presence of tip and ring currents, comprising: a light-emitting diode, a Zener diode connected in parallel with said light-emitting diode, said light-emitting diode and Zener diode being connected in series with said tip circuit; a neon lamp in series with said ring circuit; and means for supporting said neon lamp and light-emitting diode for display in juxtaposed relation.

3,944,753

APPARATUS FOR DISTINGUISHING VOICE AND OTHER NOISE SIGNALS FROM LEGITIMATE MULTI-FREQUENCY TONE SIGNALS PRESENT ON TELEPHONE OR SIMILAR COMMUNICATION LINES

Darryl F. Proctor, Redmond; Peter T. Skelly, Issaquah, and Louis W. Champan, Kent, all of Wash., assignors to Proctor & Associates Company, Redmond, Wash.

Filed Oct. 31, 1974, Ser. No. 519,432
Int. Cl.² H04M 1/00
U.S. Cl. 179—84 VF 12 Claims



1. An apparatus for detecting when signals appearing on a communications line do not contain voice or other noise signals, comprising:

a. detector means coupled to the communications line for providing a first output signal which is initiated whenever signals appear on the communications line and which is terminated only when the signals on the communications line rapidly undergo a variation in frequency exceeding a predetermined amount,

b. timing means coupled to said detector means for providing a second output signal at a predetermined time after said first output signal is initiated by said detector means, and

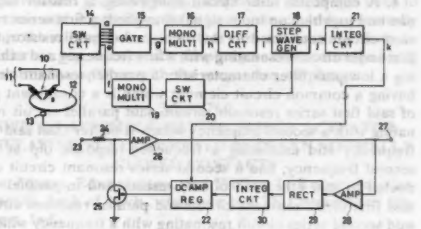
c. gating means coupled to said detector means and to said timing means and providing a third output signal upon the concurrence of said first and second output signals.

3,944,754

RECORD DISC RECORDING SYSTEM WITH SIGNAL AMPLITUDE CONTROLLED BY STYLUS ARM POSITION

Yukinobu Ishigaki, Yamato, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 26, 1974, Ser. No. 454,908
Claims priority, application Japan, Mar. 26, 1973, 48-34389; Mar. 26, 1973, 48-34390
Int. Cl.² G11B 3/00
U.S. Cl. 179—100.4 C 3 Claims



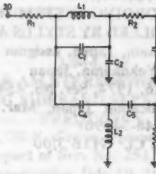
1. A record disc recording system comprising: cutting and recording means having a cutter head for cutting and recording signals on a rotating disc with cutting extending from the outer periphery toward the inner periphery thereof; means for generating position pulse signals at successive specific intervals during the period while the cutter head moves from the outer periphery across the disc to the inner periphery thereof; means responsive to the position pulse signals for generating a control voltage of a stepped waveform, said control voltage increasing in successive steps responsive to the receipt of each of the position pulse signals; limiting amplification means for amplitude limiting input recording signals; control means for controlling the gain of said limiting amplification means in accordance with said control voltage whereby the degree of the amplitude limiting of the recording signals increases successively as the cutter head moves from the outer periphery over the disc toward the inner periphery thereof; means for applying the output signals of said limiting amplification means to said cutter head in which said limiting amplification means comprises voltage dividing means including a series combination of a resistor and a variable resistance element, means for applying recording signals across said voltage dividing means, a main amplifier for amplifying the signal appearing across the variable resistance element; said control means comprises rectifier means for rectifying one portion of the output signal of said main amplifier and integrating the rectified signal to produce a second control voltage, DC amplifier and regulating circuit means responsive jointly to the control voltage of said stepped waveform and to the second control voltage for amplifying the control voltage of said stepped waveform while the gain of said DC amplifier and regulating circuit means is controlled responsive to the second control voltage, and means for controlling the resistance value of said variable resistance element in accordance with the output signal of said DC amplifier and regulating circuit means.

3,944,755

COMPOSITE FILTER CIRCUIT

Nobuaki Takahashi, Yamato; Masao Kasuga, Sagamihara, and Yasuo Itoh, Tokyo, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 18, 1975, Ser. No. 550,376
Claims priority, application Japan, Feb. 25, 1974, 49-21356
Int. Cl.² G11B 3/74; H03H 5/06
U.S. Cl. 179—100.4 ST 7 Claims



1. A composite filter circuit comprising: a resistor having one end to which an input signal is applied; a first series resonant circuit connected to the other end of said resistor, said first series circuit resonating with a first frequency and exhibiting a low-pass filter characteristic; a parallel resonant circuit having a common circuit element which is a constituent part of said first series resonant circuit, said parallel circuit resonating with a second frequency which is higher than said first frequency and exhibiting a frequency-response dip at said second frequency; and a second series resonant circuit connected to said other end of said resistor and in parallel with said first series resonant circuit and parallel resonant circuit, said second series circuit resonating with a frequency which is substantially equal to said second frequency and exhibiting a high-pass or band-pass filtering characteristic, said first series resonant circuit and parallel resonant circuit constituting a low-pass filter circuit for filtering signals of a first specified frequency band, said second series resonant circuit constituting a high-pass or band-pass filter circuit for filtering signals of a second specified frequency band, said low-pass filter circuit section producing an output signal filtered with a low-pass filtering characteristic responsive to the low-pass filtering characteristic of said first series resonant circuit, said filtered output signal having a dip characteristic at said second frequency and frequencies in the neighborhood thereof, and a decreasing characteristic at said second frequency and frequencies in the neighborhood thereof, said high-pass filter circuit producing an output signal filtered with a high-pass or band-pass filtering characteristic responsive to a total of the high-pass or band-pass filtering characteristic of said second series resonant circuit and a decreasing characteristic at said first frequency and frequencies in the neighborhood thereof.

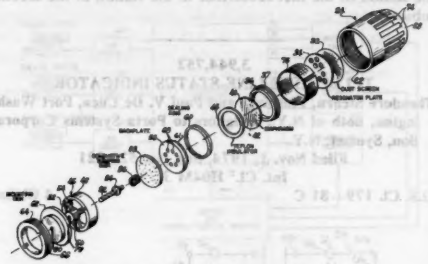
3,944,756

ELECTRET MICROPHONE

Thomas C. Lininger, New Buffalo, Mich., assignor to Electro-Voice, Incorporated, Buchanan, Mich.

Filed Mar. 5, 1975, Ser. No. 555,411
Int. Cl.² H04R 19/04
U.S. Cl. 179—111 E 12 Claims

1. A capacitor transducer comprising, in combination, an electrically conducting housing having an opening at one end for the passage of sound waves, a vibratile electrically conducting diaphragm mounted within the housing confronting the opening and electrically connected to the housing, an electrically conducting plate mounted within the housing on the side of the diaphragm opposite the opening and electrically insulated from the housing, said plate having a flat surface disposed parallel to and spaced from the diaphragm, the perimeter of said plate being acoustically sealed on the housing, and said plate having a plurality of channels extending therethrough to permit sound waves to pass through the plate, an acoustic damping member disposed within the housing and abutting the surface of the plate opposite the diaphragm, said member being constructed of electrically conducting porous material and being electrically insulated from the housing, a support member of electrically insulating material disposed



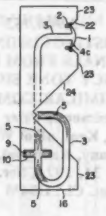
within the housing confronting the acoustic damping member on the side thereof opposite the electrically conducting plate, electrical contact means mounted on the support member and abutting the acoustic damping member including an electrically conducting pin and a spring mounted on the pin for maintaining pressure between the pin and the damping member.

3,944,757

HIGH-FIDELITY MOVING-COIL LOUDSPEAKER

Kenkichi Tsukamoto, 47, Koyamashimofusa-cho, Kita, Kyoto, Japan

Filed Aug. 1, 1974, Ser. No. 493,891
Claims priority, application Japan, Aug. 4, 1973, 48-87720
Int. Cl.² H04R 9/06
U.S. Cl. 179—115.5 H 2 Claims



1. In a loudspeaker of a type including means for producing a steady magnetic field, a moving-coil disposed in said steady magnetic field thereby to effect displacement in accordance with a signal current flowing through said moving-coil and a diaphragm secured to said moving coil for converting the displacement of the moving coil into a sound wave, the improvement comprising a tubular member having a length greater than the wavelength corresponding to any of the frequencies in a frequency range and a constant cross-sectional area smaller than the surface area of the diaphragm throughout the length of the tubular member, a coupling member for coupling one end of said tubular member to one side of said diaphragm in such a manner that an air chamber is formed between said diaphragm and said end of the tubular member, a conical horn at the center of which a small conical reflecting portion is formed, the other end of said tubular member being arranged to face against said small conical reflecting portion with a suitable gap, thereby matching the acoustic impedance of said tubular member to the characteristic acoustic impe-

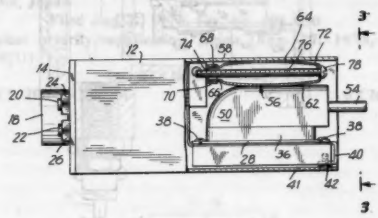
dance of the outer atmosphere, and at least one acoustic filter provided at a specific position in said tubular member.

3,944,758

TALK LINE MULTIPLE COMMUNICATION AND TEST APPARATUS

William V. Carney, Valley Stream, and Paul V. DeLuca, Port Washington, both of N.Y., assignors to Porta Systems Corporation, Syosset, N.Y.

Filed Oct. 13, 1971, Ser. No. 188,722
Int. Cl.² H04M 3/22; H01R 7/06
U.S. Cl. 179—175 7 Claims



1. A talk line multiple communication and test apparatus comprising

a housing,

a face plate, and

a switch member having a plurality of selectable switching positions,

means for securing said face plate with respect to said housing,

said switch member being disposed within said housing,

at least one input jack connected with respect to said housing,

connector means comprising at least one input connector and one output connector disposed within said housing and providing a plurality of individual communication channels,

means for electrically connecting said input connector to said output connector,

said input and output connectors being of the multi-terminal type which are adapted to receive mating multi-terminal type connectors in mating engagement therewith,

a biasing member disposed within said housing between the interior of one of the walls thereof and in abutting engagement with one of the mated connectors and exerting a biasing force thereupon to maintain said mated connectors in secure mated engagement thereby ensuring electrical connection,

said biasing member having a substantially rectangular configuration including a pair of side walls and a pair of end walls,

each of said end walls having an opening formed therein,

at least one of said openings being internally threaded,

said biasing member including a threaded bolt,

said bolt being disposed within said openings in threaded engagement with said threaded one of said openings,

said bolt being operable upon rotational movement thereof to vary the spacing between said end walls to thereby regulate the longitudinal axial forces imparted to said side walls to selectively regulate the spacing between said side walls,

means for electrically connecting said input jack to said switch member, and

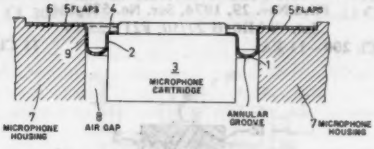
means for electrically connecting said connector means to said switch member to enable said switch member to be selectively connected with one of said individual communication channels to permit communication over said selected channel via said input jack.

3,944,759

MICROPHONE PROVIDED WITH A CYLINDRICALLY SHAPED MICROPHONE CARTRIDGE

Cornelis Penning, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 27, 1973, Ser. No. 419,431
Claims priority, application Netherlands, Dec. 6, 1972, 7216501
Int. Cl.² H04R 1/02
U.S. Cl. 179—184 16 Claims



1. A microphone assembly comprising a microphone case, a cylindrically shaped lightweight microphone cartridge including a generally planar acoustic vibratory diaphragm, a single resilient generally planar suspension diaphragm fixed to the case and supporting the microphone cartridge centrally within the microphone case so that case and cartridge form an annular air gap, the acoustic diaphragm of the cartridge being substantially coplanar with the suspension diaphragm.

3,944,760

SWITCH ASSEMBLY HAVING SLIDER ACTUATOR INSULATING PLATE INSERTED BETWEEN NORMALLY CLOSED CONTACTS

John Zdanys, Edwardsburg, and William L. Kelver, Jr., Cassopolis, both of Mich., assignors to CTS Corporation, Elkhart, Ind.

Filed Apr. 8, 1974, Ser. No. 458,505
Int. Cl.² H01H 15/02, 27/04
U.S. Cl. 200—6 BB 13 Claims

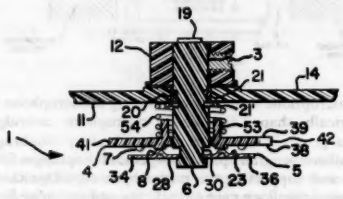
1. In a slide switch, the combination of a cover having a plurality of side walls and a top wall provided with a slot, a base having first and second base sections secured to the cover, the walls of the cover and the base defining a cavity, a flexible guide means cantilevered within the cavity, a first intermediate member extending perpendicular from one end of the guide means and embedded in the first base section, a terminal integral with the first intermediate member, a movable contact arm disposed within the cavity, a U-shaped contact element integral with one end of the movable contact arm, a second intermediate member extending perpendicular from the other end of the movable contact arm and embedded in the second base section, a terminal integral with the second intermediate member, the U-shaped contact element being biased into engagement with the guide means, an actuator in slideable engagement with the flexible guide means, the actuator comprising a pair of side walls, a bight portion connecting the side walls, a cam disposed between the side walls, and an operating arm integral with the bight portion and extending through the slot in the top wall of the cover, said cam, bight portion and side walls of the actuator defining an opening, the flexible guide means being disposed within the opening, said U-shaped contact element and the movable contact arm being movable with respect to the flexible guide means for aligning

the actuator with respect to the contact element and the movable contact arm whereby movement of the actuator moves the cam in an interference path with respect to the U-shaped contact element.

3,944,761
ROTARY SWITCH

Thomas H. Nicholl, Leawood, Kans., and John J. Collins, Kansas City, Mo., assignors to Nicholl Brothers, Inc., Kansas City, Mo.

Filed Nov. 29, 1974, Ser. No. 528,284
Int. Cl.² H01H *21/50*; F21V *23/04*
U.S. Cl. 200—11 EA **11 Claims**



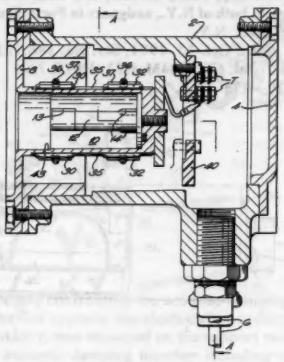
1. A rotary switch comprising:
a. an elongated rotatable stem having an operating knob on one end thereof and retainer means on the other end thereof and keying surfaces adjacent said retainer means;
b. a stator having an aperture therethrough for rotatably receiving said stem;
c. spaced electrical contact means on said stator including a plurality of spaced heads extending therefrom;
d. an electrically conductive switch rotor positioned between said retainer means and said stator, said switch rotor being mounted on said stem and movable longitudinally thereof and having an aperture with keying surfaces in engagement with said keying surfaces of said stem and rotatable therewith, said switch rotor being adapted for selective engagement with said electrical contact means;
e. means on said stator engageable by said switch rotor to permit same to move into and out of engagement with said electrical contact means in response to rotation of said stem;
f. a support positioned between said stator and the operating knob on said stem, said support having an aperture therethrough for receiving said stem and permit rotation of said stem;
g. means between said stator and said support for retaining said stator against rotation and permitting movement of the stator longitudinally of said stem; and
h. resilient means between the support and stator urging the stator toward the switch rotor for maintaining engagement thereof and the switch rotor in engagement with the retainer means with the keying surfaces engaged and permitting the switch rotor to engage selected electrical contact means in response to rotation of said stem.

3,944,762
KEY-OPERATED SWITCHES

Arthur Coleman; Andrew Swan, both of Dundee, and David Doig, Monifieth, all of Scotland, assignors to Veeder Industries, Inc., Hartford, Conn.

Filed Sept. 11, 1974, Ser. No. 505,157
Claims priority, application United Kingdom, Sept. 18, 1973, 43685/73
Int. Cl.² H01H *9/00*
U.S. Cl. 200—44 **9 Claims**

1. In a multiple-key switching system having a plurality of different keys, each having a different key body structure, for a plurality of different authorized users respectively, a keyway housing with a keyway for receiving the key body structures of the plurality of keys one at a time, and a plurality of separate switches mounted in association with the keyway housing, each of the key body structures being operable within the keyway for operating different combinations of switches respectively, the improvement wherein the keyway housing is generally tubular, wherein said switches are magnetically

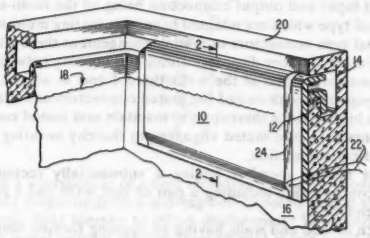


operable switches and are mounted in a generally annular arrangement about the tubular housing keyway, and wherein the different key body structures of the plurality of different keys have different generally annular arrangements of magnetic elements respectively for magnetic association with the respective combinations of switches respectively whereby each of the key body structures is operable within the keyway for magnetic operation of the respective switches.

3,944,763
SWIMMING POOL TOUCH PAD

Richard R. Beierwaltes, 513 N. 4th Ave., Maywood, Ill. 60153

Filed Nov. 1, 1974, Ser. No. 519,869
Int. Cl.² H01H *3/02*, *35/00*; A63K *3/00*; G07C *1/22*
U.S. Cl. 200—52 R **14 Claims**



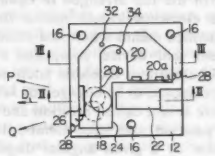
1. A swimming pool touch pad including in combination:
a nonconductive baseplate adapted to be mounted on a swimming pool wall,
a normally nonconductive generally planar pressure sensitive elastomeric pad having front and rear surfaces positioned on said baseplate and adapted to become selectively conductive upon application of pressure to the front surface thereof to provide an electrical current path therethrough in the area of such application and transversely through the pad between the front and rear surfaces,
conductive means coupled to the respective surfaces of said elastomeric pad and extending to the exterior of said touch pad to provide connection to an external electrical circuit,

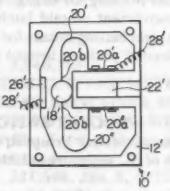
a nonconductive waterproof, flexible cover member secured to said baseplate and enclosing said pad, the conductive means being passed through said cover member, said cover member being capable of immediately transmitting externally applied pressure to said elastomeric pad to render same conductive for closing the external electrical circuit to which said conductive means may be connected.

3,944,764
INERTIA SENSOR SWITCH

Kenzo Hirashima, and Yasuhiko Fujiwara, both of Yokohama, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Aug. 8, 1974, Ser. No. 496,020
Claims priority, application Japan, Aug. 17, 1973, 48-96138[U]
Int. Cl.² H01H 35/14
U.S. Cl. 200—61.45 M **6 Claims**



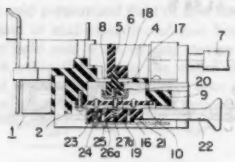


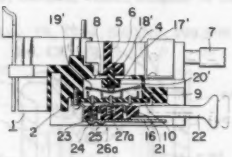
1. In a vehicle having a longitudinal direction,
an inertia sensor switch comprising:
a housing of an insulating material fixedly secured to the vehicle;
a fixed electrical contact plate mounted securely to the interior of the housing, the fixed electrical contact being connected to one of two electric wires;
an electrically conductive mass selectively abuttingly engageable with the fixed electrical contact plate; and
a U-configured resilient strip having one leg secured to a portion of the housing and other leg fixed to the mass, the U-configured resilient strip being made of an electrical conductive material and serving as an electrical path between the mass and other one of the two electric wires, the U-configured resilient strip resiliently biasing the mass to an initial inoperative position that is spaced from the fixed electrical contact plate rearwardly in the longitudinal direction with respect to the vehicle;
in which the U-configured resilient strip lies in a plane normal to deceleration due to up and down vibration of the vehicle, the U of the U-configured resilient strip being open to a transverse direction relative to the longitudinal direction.

3,944,765
COMBINATION TURN-SIGNAL AND HAZARD-WARNING SWITCH MEANS FOR AN AUTOMOBILE

Yoshihiro Kawai, and Atushi Takemura, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed July 9, 1974, Ser. No. 486,927
Claims priority, application Japan, July 11, 1973, 48-81998[U]
Int. Cl.² H01H 3/16; B60Q 1/38
U.S. Cl. 200—61.27 **12 Claims**





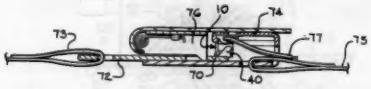
1. A combination turn-signal and hazard-warning switch means for an automotile having right and left indicator lights, which comprises turn-signal actuating means including a control lever and hazard-warning actuating means including a control knob, and which further comprises:
housing means;
stationary contact means mounted on said housing means, said stationary contact means having an insulator plate member and sets of first and second stationary contact members respectively provided on opposite sides of said insulator plate member in row arrangement, respective contact members being connected to a power source and the right and left indicator lights;
first movable contact means including a first movable contact member having two operating portions disposed along said row arrangement of the first stationary contact members so as to make contact therewith and a first actuator member for said first movable contact member, which first actuator member is normally in a neutral position and movable into first and second operative positions upon the operation of said turn-signal actuating means to bring said operating portions into an indication operative position, making a turn-signal circuit through said first and second stationary contact members; and
second movable contact means having second movable contact members disposed along said row arrangement adapted to contact said second stationary contact members and a second actuator member for said second movable contact members;
said second actuator member being normally in a neutral position and movable into an operative position in the direction of said row arrangement upon the operation of said hazard-warning actuating means to make a hazard-warning circuit in cooperation with said second movable contact members and said second stationary contact members through their contacting relation;

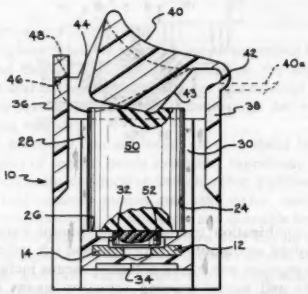
means mounting said first and second movable contact means on said housing means for movement parallel to each other and to said row arrangement.

3,944,766
SEAT BELT BUCKLE HAVING PUSHBUTTON TYPE SWITCH WITH ELASTOMERIC CONDUCTOR BRIDGING CONTACT

Charles G. Wood, Royal Oak, Mich., assignor to Essex International, Inc., Fort Wayne, Ind.

Filed July 3, 1974, Ser. No. 485,355
Int. Cl.² H01H *3/16, 13/62*
U.S. Cl. 200—61.58 B **11 Claims**





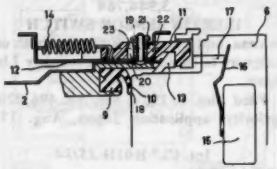
1. An electrical switch comprising a non-conductive housing having a main bore extending inwardly from one end of said housing means in said housing defining a shoulder at the inner end of said main bore and a second bore coaxial with said main bore extending inwardly of said housing from said shoulder; spaced apart electrical conductors carried by said housing and exposed within and on opposite sides of said second bore; a bridging member spanning said conductors and movable between positions in which it electrically connects and disconnects said conductors; a resiliently deformable operating member snugly mounted in said main bore and seated at its inner end on said shoulder, the inner end of said operating member being responsive to the application of an axially compressive force to the outer end thereof to protude inwardly beyond said shoulder into said second bore from a normal condition to a deformed condition thereby to effect movement of said bridging means from one of said positions to the other and being responsive to the release of said force to return to its normal condition and effect movement of said bridging means from said other position to said one position; and actuating means engageable with said outer end of said operating member for for applying and releasing said compressive force to and from said operating member.

10. A switch according to claim 1 including means acting on said actuating means and maintaining the latter in compressive engagement with said operating member.

3,944,767
DISHWASHING MACHINE CLOSURE SAFETY SWITCH DEVICE

Sergio Rabuffetti, Trento via Della Collina, Italy, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 24, 1974, Ser. No. 473,218
Claims priority, application Italy, May 25, 1973, 24593/73
Int. Cl.² H01H *3/16;* **B08B** *3/00*
U.S. Cl. 200—61.62 **2 Claims**

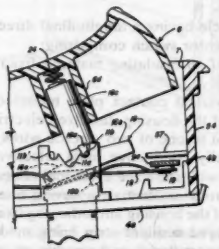


1. A safety device for a dishwashing machine comprising a housing, a tub mounted in the housing, an electrically controlled means for spraying water in the tub, a closure for an access opening of the tub arranged to open by angular displacement, and electrical switch means for disabling said electrically controlled means when said closure is in an open position, wherein said device comprises a catch member mounted on said closure, a movable latch member mounted on said housing disposed to be engaged by said catch member while said closure is in a closed position and said latch member is in a first position, said latch member being movable to a second position by a given angular displacement of said closure from said closed position, said given angular displacement being such that any vapor enclosed under pressure within said tub may escape past said closure, a stop member connected to said housing for engaging said latch member so as to prevent movement of said latch member beyond said second position, and biasing means for urging said latch member from said second position toward said first position.

3,944,768
ROCKER SWITCH

Avinash Aryamane, Mount Prospect, and Marvin A. Kruse, Chicago, both of Ill., assignors to Littelfuse, Inc., Des Plaines, Ill.

Filed Nov. 30, 1973, Ser. No. 420,647
Int. Cl.² H01H *13/28*
U.S. Cl. 200—67 G **4 Claims**



1. In a switch including a handle member pivotable about a given axis, a movable contact carrying spring member having longitudinally spaced spring portions each of which individually snap into two different configurations when pulled toward or pushed away from said handle member, and a stationary contact to be engaged by the movable contact on said member, the improvement in operating means for interconnecting said handle member and said movable contact carrying member, said operating means comprising: an actuator member

which is resiliently floatingly mounted on said handle member for movement toward and away from said handle member and which rocks with the pivoting of said handle member, stationary fulcrum-forming means against which a follower portion of said actuator member is resiliently urged, the shape of one of said fulcrum-forming means and follower portion being such that the distance of the outer end portion of said actuator member from said handle member varies as the handle member is moved between a first and a second position thereof, and said actuator member having member pulling and pushing portions on the outer end portion thereof which engage said spring member for moving the same between positions where said movable and stationary contacts are respectively in and out of engagement as the handle member is moved between said first and second positions thereof, said longitudinally spaced spring portions extending longitudinally on opposite sides of said pulling and pushing portions of said actuator member, said spring member being engagable on the sides facing both toward and away from said handle member by said pulling and pushing portions of the actuator member, said actuator member when tilted in one direction by said handle member causing the pulling and pushing portions thereof respectively to pull one of said spring portions into a position where it snaps into a configuration extending toward said handle member and push the other spring portion into a position where it assumes another configuration and when tilted in the opposite direction causing the pulling and pushing portions thereof to pull said other spring portion into a position where it snaps into a configuration extending toward said handle member and push said one spring portion into a position where it assumes another configuration, the return of the handle member to a centered position causing said pulling and pushing portions to push the previously deformed portion of the spring member into a position where it snaps into its previous configuration, and contacts at each end of said spring member respectively engagable with stationary contacts adjacent thereto in one of the configurations of the adjacent spring member portions.

3,944,769

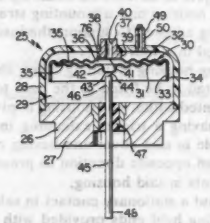
PRESSURE SENSING MEANS AND METHOD FOR MAKING A PRESSURIZED CONTAINER MEANS AND SYSTEM UTILIZING THE SAME

Joseph P. Wagner, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 321,648, Jan. 8, 1973, abandoned. This application Sept. 25, 1974, Ser. No. 509,009

Int. Cl.² H01H *35/34*

U.S. Cl. 200—83 A **3 Claims**



1. In combination, a container means having a pressurized fluid therein, and fluid operated sensing means carried by said container means for sensing pressure changes within said container means, said sensing means and said container means being so constructed and arranged that said sensing means is temperature compensated by being disposed within said container means to be substantially surrounded by a reference pressure of said fluid of said container means so that pressure changes of said fluid in said container means caused by temperature changes thereof are ineffective to cause sensing thereof by said sensing means as the fluid of said sensing means is at the same temperature as said fluid in said container means, said fluid operated sensing means and said container means having been initially charged with their respective pressurized fluids to substantially the same pressure levels, said sensing means comprising a housing means secured in said container and having a chamber therein, a double wall fluid operated device disposed in said chamber of said housing means and being carried by the same, said walls of said device defining a chamber therebetween, said device having passage means interconnecting said chamber of said device to the exterior of said housing means so as to be in fluid communication with said fluid in said container means, and a charge of pressure fluid sealed in said chamber of said housing means to provide said pressurized fluid of said sensing means, said charge of fluid in said chamber of said housing means being adapted to hold said walls of said device in intimate contact with each other throughout the entire effective surface areas thereof so that the same will not take a permanent set when the chamber therebetween is at atmospheric conditions.

3,944,770

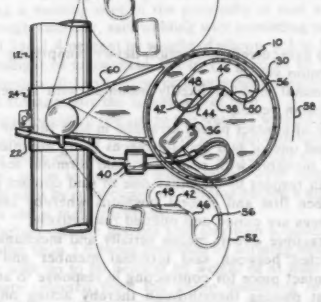
SWITCH ASSEMBLY

Kenneth V. Pepper, Davison, Mich., assignor to Genova, Inc., Davison, Mich.

Filed Aug. 19, 1974, Ser. No. 498,599

Int. Cl.² H01H *35/18*

U.S. Cl. 200—84 R **6 Claims**



1. A submersible switch assembly for starting and stopping a pump that is operable to remove liquid intermittently upon demand from a chamber comprising a mounting bracket, a hermetically sealed float pivotally mounted on said bracket for pivotal movement between an upper and a lower position, said float containing an electrical switch with a trip arm for closing and opening the switch, a raceway extending generally in a radial direction relative to the axis of pivotal movement of the float and located adjacent to said electrical switch and into which said trip arm extends, said raceway having an intermediate portion and radially inner and outer end portions, said radially inner and outer end portions having positive slopes toward said intermediate portion at all times during pivotal movement of said float except when said float is pivoted essentially to its upper or lower positions, the radially inner end portion having a negative slope toward the intermediate portion only when said float is pivoted essentially to its lowermost position and the radially outer end portion having a negative slope toward the intermediate portion only when said float is pivoted essentially to its uppermost position, and a roller element movable in response to gravity the length of said raceway, said roller element being operable when said

float is pivoted to its lower position to roll from the radially inner end of said raceway over said intermediate portion to the radially outer end and operable when said float is pivoted to its upper position to roll from said radially outer end over said intermediate portion to said radially inner end, said trip arm extending into said raceway so as to be actuated by said roller element during traverse of said raceway, said trip arm entering said raceway at a location adjacent to the inner end of the radially inner end portion and extending to a location adjacent to said intermediate portion so that maximum mechanical advantage for closing said switch occurs when the roller element passes radially inwardly over the extended end of the trip arm.

3,944,771

OVERCURRENT PROTECTION DEVICE

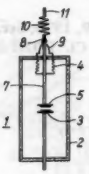
Werner Kohler, Bentfeld, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 14, 1973, Ser. No. 424,690

Claims priority, application Germany, Dec. 29, 1972, 2264342

Int. Cl.² H01B *33/66*

U.S. Cl. 200—144 B **7 Claims**



1. An overcurrent protection device comprising:
a vacuum vessel;
a terminal member fixedly mounted with respect to said vacuum vessel;
a pair of contact pieces arranged in said vacuum vessel;
at least one of said contact pieces being mounted so as to be movable with respect to said terminal member and with respect to the other one of said contact pieces between first and second positions whereby said contact pieces are closed and opened respectively;
contractible circuit means serially and mechanically connected between said terminal member and said one contact piece for contracting in response to an overcurrent passing therethrough thereby acting on said one contact piece to move the same from said first position to said second position;
latching means for latching said movable contact piece when the same is moved to said second position thereby preventing the closing of said contact pieces; and
releasing means for releasing said latching means thereby allowing said contact pieces to close.

3,944,772

CIRCUIT BREAKER WITH LOW TORQUE MOTOR

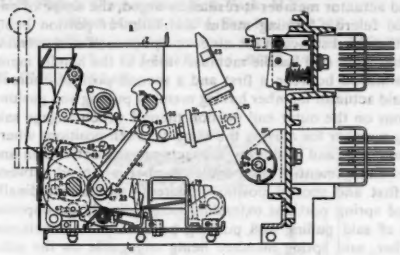
Norman Davies, Trafford, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 18, 1974, Ser. No. 515,946

Int. Cl.² H01H *3/30*

U.S. Cl. 200—153 SC **8 Claims**

1. A circuit breaker comprising a pair of contacts operable between open and closed positions, a crankshaft structure, closing spring means connected to said crankshaft structure, a ratchet wheel movable to move said crankshaft structure from a spring discharged position to a spring charged position to charge said closing spring means releasable latch means latching said crankshaft structure in said spring charged position, an oscillating drive pawl structure in driving engagement with said ratchet wheel, operating means comprising a motor having an output shaft operable to oscillate said drive pawl structure to move said ratchet wheel to thereby move said



crankshaft structure from said spring discharged position to said spring charged position, and the oscillating drive pawl structure comprising a bight portion movable across the axis of the output shaft.

3,944,773

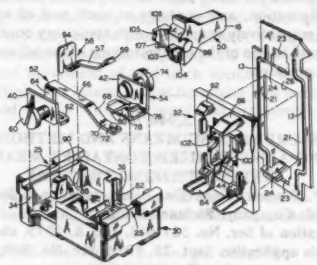
AC SWITCH WITH CANTELEVER CONTACT AND BALANCE SPRINGS

Walter C. Schumacher, Warwick, R.I.

Filed Mar. 28, 1974, Ser. No. 455,834

Int. Cl.² H01H *9/08*

U.S. Cl. 200—293 **6 Claims**



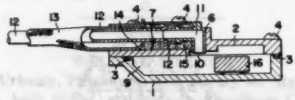
1. A switch subject to automated assembly comprising:
a. an insulating housing and a mounting strap, said mounting strap being adapted to support the insulating housing when mounted in a wall box,
b. said insulating housing including a box shaped base and a cover adapted to be fitted to the base to close it,
c. a toggle mounted within said housing in pivoting relation, said toggle having a trigger extending in one direction through a hole in said cover and having cams extending generally in an opposite direction to press against spring biased elements in said housing,
d. a movable and a stationary contact in said housing, said contacts having held ends provided with wire terminals and free ends bearing electric contacts adapted to be engaged and disengaged with the pivoting of said toggle,
e. said contacts being loosely supported in the base of said housing from their held ends at wall portions of said base and said contacts being firmly held at such wall portions by bosses depending from the cover of said housing,
f. a balance spring having a held end and a curved free end in contact with a cam of said toggle and applying spring bias pressure against said curved free end, and
g. the held end of said balance spring being loosely supported in said base and being firmly held by bosses depending from the cover.

3,944,774

ELECTRIC SWITCH HAVING A SEALED CASING

Motoi Noba, Toyota, and Hatsuyoshi Yoshida, Toyoake, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Tokai Rika Denki Seisakusho K.K., both of, Japan

Filed Aug. 7, 1974, Ser. No. 495,430
Int. Cl.² H01H 9/04
U.S. Cl. 200—302 8 Claims



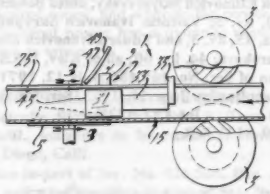
1. An electric switch which comprises:
a movable contact and fixed contacts;
a casing for enclosing said contacts;
said casing defining a chamber in which said movable contact is disposed, and including a cover to render the same waterproof, the outside wall of said cover defining a cavity having apertures therein through which said fixed contacts are installed with their contact surfaces extending into said chamber;
a plurality of lead wires disposed in said cavity of said cover and connected to said fixed contacts;
a compound packed in said cavity to ensure the sealed state of said chamber;
and means to conduct atmospheric air into and from said casing from a region remote from said casing.

3,944,775

WELDING PROCESS

Donald P. Worden, Union Grove, Wis., assignor to Tenneco Inc., Racine, Wis.

Filed Dec. 11, 1972, Ser. No. 313,664
Int. Cl.² B23K 31/06
U.S. Cl. 219—67 33 Claims



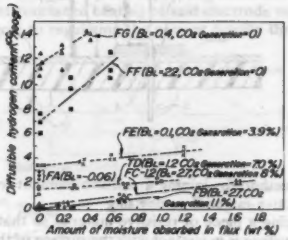
1. A method of continuously welding together to form a seam the abutting edges of metal which comprises continuously moving the metal longitudinally in one direction, heating the edges to be welded together, passing the heated edges through squeeze roll means to apply welding pressure to the edges, and separating the edges in advance of the weld line defined by the squeeze roll means to maintain them out of pressure contact with each other until they reach a point approximately 1 to 3 metal thicknesses in advance of said weld line.

3,944,776

METHOD OF SUBMERGED ARC WELDING OF HIGH TENSION STEEL WORKPIECES

Junichiro Tsuboi, No. 483-14 Nitona-cho, and Hisaei Terashima, No. 1, 1-Chome, Miyazaki-cho, both of Chiba, Japan

Continuation-in-part of Ser. No. 224,469, Feb. 8, 1972, abandoned. This application Sept. 21, 1973, Ser. No. 399,402
Claims priority, application Japan, Feb. 15, 1971, 46-6393
Int. Cl.² B23K 9/18, 35/22
U.S. Cl. 219—73 4 Claims


Diffusible hydrogen content (cc/100g)
FG (Bl.=0.4, CO₂ Generation=0)
FF (Bl.=2.2, CO₂ Generation=0)
FE (Bl.=0.4, CO₂ Generation=3.9%)
FD (Bl.=1.2 CO₂ Generation=7.0%)
FC-12 (Bl.=2.7, CO₂ Generation 8%)
FA (Bl.=0.06)
FB (Bl.=2.7, CO₂ Generation 11%)
Amount of moisture absorbed in flux (wt %)

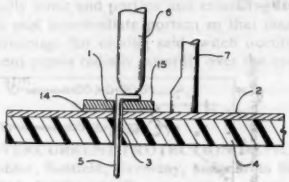
1. A method of submerged arc welding a workpiece of high tension steel with a tensile strength of at least 60 Kg/mm², comprising the steps of
covering a weld joint of the workpiece with bonded flux containing carbonate capable of generating at least 7 percent by weight of carbon dioxide gas, based on the total weight of the flux, during the welding operation and producing slag with a basicity of not smaller than 1.0;
placing a welding wire in the proximity of said weld joint through said flux, said welding wire consisting essentially of 0.3 to 1.4 percent by weight of silicon, 0.3 to 3 percent by weight of manganese, 0.1 to 1.7 percent by weight of chromium, 0.1 to 1.10 percent by weight of molybdenum, and substantially the remainder of iron;
applying a welding voltage to the welding wire so as to feed a welding current to said weld joint through said welding wire while moving said welding wire relative to said weld joint, so as to generate high tension weld metal in the weld joint by submerged arc welding having a high toughness and a high crackresistivity;
said carbon dioxide gas and said slag with a basicity of not smaller than 1.0 being provided by forming said bonded flux with up to 60 percent by weight of at least one carbonate selected from the group consisting of calcium carbonate, magnesium carbonate, sodium carbonate, barium carbonate, manganese carbonate, 4 to 16 percent by weight of silicon dioxide, 8 to 24 percent by weight of alumina, and the remainder of at least one compound selected from the group consisting of calcium oxide and magnesium oxide;
said weld metal consisting essentially of 0.04 to 0.07 percent by weight of carbon, 0.2 to 0.8 percent by weight of silicon, 1 to 1.8 percent by weight of manganese, 0.15 to 0.9 percent by weight of molybdenum, 0.1 to 1.5 percent by weight of chromium, 0.1 to 3.5 percent by weight of nickel, and substantially the remainder of iron, the steel of said workpiece containing 0.06 to 0.25 percent by weight of carbon, 0.01 to 0.55 percent by weight of silicon, 0.40 to 1.60 percent by weight of manganese, 0.01 to 0.50 percent by weight of copper, 0.01 to 2.50 percent by weight of nickel, 0.01 to 1.50 percent by weight of chromium, less than 1.00 percent by weight of molybdenum, 0.01 to 0.09 percent by weight of aluminum, less than 0.15 percent by weight of vanadium, less than 0.005 percent by weight of boron, less than 0.10 percent by weight of titanium, and less than 0.05 percent by weight of niobium.

3,944,777

METHOD FOR JOINING RESISTIVE AND CONDUCTIVE MATERIALS

David Porat, 17 Englewood Ave., Brookline, Mass. 02146

Filed Dec. 13, 1974, Ser. No. 532,739
Int. Cl.² B23K 11/20
U.S. Cl. 219—118 10 Claims



1. A method for joining a resistive element to a surface of a conductive material comprising

a. placing a piece of resistive material so that a portion of its surface is in contact with the surface of the conductive material;

b. placing the resistive element in contact with the piece of resistive material; and

c. passing a current through both the piece of resistive material and the resistive element of sufficient magnitude to spot weld them together,

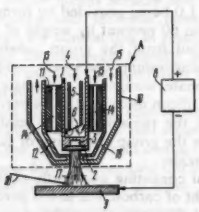
whereby the piece of resistive material and the resistive element will be spot welded to each other and heat from that spot weld will thereby cause the conductive material to be joined to the piece of resistive material by diffusion.

3,944,778

ELECTRODE ASSEMBLY OF PLASMATRON

David Grigorievich Bykhovsky, Konjushenny pereulok 1/6, kv. 18; Aldexandr Ivanovich Danilov, V.O. 16 Linia, 79, kv. 15, and Mikhail Shikovich Brodsky, ulitsa Ordzhonikidze, 10, kv. 27, all of Leningrad, U.S.S.R.

Filed May 14, 1974, Ser. No. 469,752
Int. Cl.² B23K 5/00
U.S. Cl. 219—121 P 7 Claims



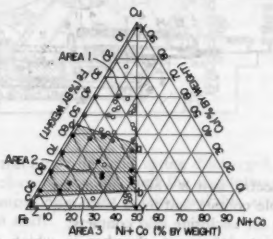
1. An electrode assembly for a plasmatron, comprising: a holder being cooled, a high-heat insert in said holder having a first face which is in contact with a near-the-electrode zone of an arc and a second face in thermal and electrical contact with said cooled holder, a chamber being formed in said holder between said high-heat insert and the interior of said cooled holder extending substantially symmetrical to the axis of said high-heat insert, and a substance filling said chamber whose coefficient of thermal conductivity is lower than that of the material of said cooled holder, the substance filling said chamber being in constant and direct contact with the central portion of said high-heat insert.

3,944,779

PROCESS FOR FUSION-WELDING IRON-NICKLE-COBALT ALLOY AND COPPER OR SAID ALLOY, COPPER AND IRON

Tomio Umino, Hitachi; Munenobu Suzuki, Mito, and Tomohiko Shida, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed July 2, 1974, Ser. No. 485,252
Claims priority, application Japan, July 4, 1973, 48-74791
Int. Cl.² B23K 15/00
U.S. Cl. 219—121 EM 7 Claims



1. A process of fusion welding comprising the steps of

forming a plurality of members, each of said members being of at least one base metal including a first base metal of an iron alloy containing up to 50% by weight of nickel and cobalt combined, a second base metal of copper, and a third base metal of iron,

disposing said members in abutting relationship with respect to one another, and

forming molten welding metal by applying welding energy to the abutting members, thereby forming a welding zone of said members,

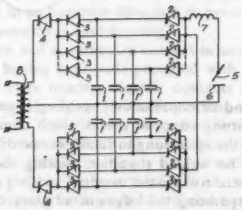
wherein said welding metal has a composition in the range of percent by weight as represented by at least one of the two areas surrounded by points X, *a*, *d* and *b*, Y, Z, *c* respectively on the three component composition diagram shown in FIG. 1.

3,944,780

POWER SUPPLY SOURCE FOR ARC WELDING

Boris Evgenievish Paton, ulitsa Kotsjubinskogo, 9, kv. 21; Daniil Andreevich Dudko, pereulok Mechnikova, 3, kv. 7; Vasily Stepanovich Gvozdetsky, ulitsa Yakira, 20/2, kv. 38; Grigory Bagradovich Asoyants, bulvar Lesi Ukrainki, 2, kv. 16; Vladik Efimovich Sklyarevsky, ulitsa Bolshaya Zhitomirskaya, 40, kv. 3; Valentin Ivanovich Skrypnik, ulitsa Ovruchskaya, 15, kv. 3, and Eduard Ivanovich Shmakov, ulitsa Krasnodarskaya, 44, kv. 60, all of Kiev, U.S.S.R.

Continuation of Ser. No. 161,486, July 12, 1971, abandoned.
This application June 11, 1973, Ser. No. 368,682
Int. Cl.² B23K 9/10
U.S. Cl. 219—131 WR 8 Claims



1. Apparatus comprising electrodes for the welding of workpieces, a power supply network, a plurality of charge-dis-

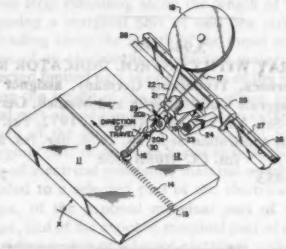
charge circuits connected in parallel; an impedor for connecting said charge-discharge circuits to one of said electrodes, the other of said electrodes being connected to said power supply; a thyristor for connecting said charge-discharge circuits to said network; each of said charge-discharge circuits including a diode, a storage capacitor and a thyristor; said diode and the latter said thyristor including and being interconnected by electrodes a of opposite polarity which are further connected to said capacitor, said diode and the latter said thyristor having further electrodes respectively connected to the first said thyristor and said impedor, said capacitor further being coupled to said network.

3,944,781

WELDING METHOD

John M. Urbanic, Pittsburgh, and Burney A. Major, Spring Church, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed May 6, 1974, Ser. No. 467,160
Int. Cl.² B23K *9/00*
U.S. Cl. 219—137 R **11 Claims**



1. A welding method comprising the steps of feeding a consumable electrode of at least ⅛-inch diameter at a constant speed toward a parent metal to be welded, while maintaining, with electrical power at an amperage-voltage characteristic having a slope of 0 to 2 amperes/volt, a direct current arc between the consumable electrode and parent metal, and while maintaining a shielding gas flow at the arc and on molten metal, wherein the electrical power is connected between the consumable electrode and the parent metal in reverse polarity, wherein the speed of the consumable electrode toward the parent metal to be welded is controlled to within plus or minus ½% of the desired speed, and wherein the power source providing the electrical power has a dynamic regulated output current of plus or minus 5%.

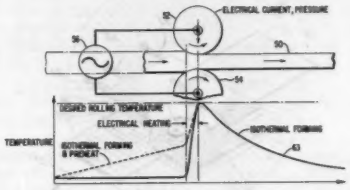
3,944,782

ISOTHERMAL METAL FORMING

Arthur G. Metcalfe, San Diego, and Fred K. Rose, Chula Vista, both of Calif., assignors to International Harvester Company, San Diego, Calif.

Continuation-in-part of Ser. No. 426,564, Dec. 20, 1973, abandoned, and a continuation-in-part of Ser. No. 227,683, Feb. 18, 1972, Pat. No. 3,823,299, said Ser. No. 426,564 is a continuation-in-part of Ser. No. 226,570, Feb. 16, 1972, said Ser. No. 227,683 and Ser. No. 226,570 are abandoned, divisions of Ser. No. 856,526, Sept. 8, 1969, Pat. No. 3,644,698. This application June 28, 1974, Ser. No. 484,307
Int. Cl.² B21J *5/08*
U.S. Cl. 219—152 **57 Claims**

53. A method for the solid state forming of a metallic workpiece into a component of selected configuration with apparatus which includes a workpiece supporting electrode means for supporting the workpiece, a rotatable, pressure applying electrode means of a refractory metallic material having a melting point above the range of iron, cobalt, and nickel adapted to engage the workpiece on the side thereof opposite the workpiece supporting electrode means, and means by which said rotatable electrode means can be so biased toward said workpiece supporting electrode means as to exert a pressure of a predetermined magnitude on said workpiece, said method comprising the steps of: heating both said workpiece in that region thereof between the refractory, pressure applying, rotatable electrode means and the workpiece supporting electrode means and that portion of the rotatable electrode means adjacent the workpiece so that the electrode means will not chill the workpiece by connecting the workpiece across an electrical power source through the pressure applying electrode means and the workpiece supporting electrode means to thereby effect resistance heating of said electrode means and said workpiece; so regulating the current density through the



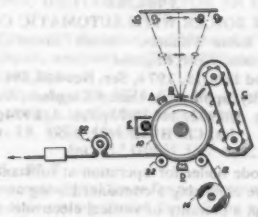
workpiece being formed and the force exerted on it by the pressure applying electrode means as to maintain the temperature of said workpiece below its melting point but sufficiently high to produce in the heated region of the workpiece between the pressure applying electrode means and the workpiece supporting electrode means a localized zone in which the workpiece is in a plastic and flowable condition; and effecting a continuous translation of the workpiece relative to the pressure applying, rotatable electrode means to thereby cause the zone in which the plastic condition exists to proceed in continuous fashion along the workpiece so that the forming of the workpiece can be effected in continuous fashion as said workpiece moves relative to the pressure applying electrode means.

3,944,783

HIGH EFFICIENCY NON-CAVITY RADIANT METHOD AND APPARATUS

Thomas L. Donnelly, and Edward J. Mullen, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 18, 1974, Ser. No. 516,059
Int. Cl.² H05B *1/00*; G03G *15/00*
U.S. Cl. 219—216 **9 Claims**



1. Apparatus for fusing electroscopic toner particles to a flexible supporting surface, said apparatus comprising:

an elongated source of radiant energy; and

a transport mechanism for transporting a flexible sheet bearing unfused toner particles along a predefined path, at least a portion of said path having a substantially cylindrical shape, said energy source being positioned in such a manner that the longitudinal axis thereof substantially coincides with the axis of said cylindrical shape, said transport mechanism comprising an endless web, means

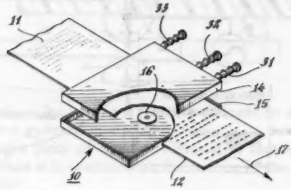
for advancing said web along said predefined path, and means for rendering said web attractive to said sheet whereby said sheet will cling to said web and be transported thereby.

3,944,784

DUAL RIBBON FUSER

Robert E. Petterec, Lindenhurst, and Mark A. Hutner, Glenview; both of Ill., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 6, 1975, Ser. No. 538,653
Int. Cl.² H05B 1/00
U.S. Cl. 219—216 4 Claims



1. Apparatus for fixing toner on a substrate, as the substrate is moved through a zone, comprising:

a. first and second members disposed on opposite sides of said zone;

b. an electrical power source;

c. a pair of electric heating elements coupled to the power source;

d. means coupling the heating elements to said first member for heating the zone, including first means for supporting one of the heating elements in a zigzag arrangement and means for biasing said first means to keep said one of the heating elements under tension; and

e. means responsive to the temperature in the zone, including a thermostat located such that when the substrate is in the zone the heating elements and the thermostat are on opposite sides thereof, coupled to the heating elements for changing the electrical load provided by the heating elements at the power supply, the load being smallest when the temperature in the zone is lower than a predetermined temperature.

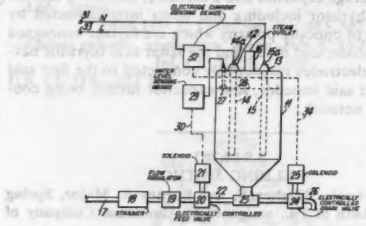
3,944,785

ELECTRODE BOILER WITH AUTOMATIC CONTROL

Raymond H. Eaton-Williams, "Beech House", Pendennis Road, Sevenoaks, Kent, England

Filed Feb. 15, 1974, Ser. No. 442,886
Claims priority, application United Kingdom, Aug. 3, 1973, 36934/73; Aug. 3, 1973, 36934/73; Feb. 4, 1974, 7835/74
Int. Cl.² H05B 1/02, 3/60
U.S. Cl. 219—286 5 Claims

1. An electrode boiler for operation at substantially atmospheric pressure comrising a container having an open steam outlet at its top, a plurality of vertical electrodes fixed inside the container, supply circuitry to supply electric current to the electrodes, feed and dra'n connections to the container respectively including electrically actuated feed and drain valves, a level sensing electrode fixed inside the container, and electronic solid state control circuitry connected to the supply circuitry and to the feed and drain valves and to the level sensing electrode, the control circuitry containing voltage-responsive means operative to open the feed valve when the water in the container is out of contact with the level sensing electrode and to close the feed valve when the water in the container is in contact with the level sensing electrode, the control circuitry also containing current-responsive means operative to open the drain valve when the electrode current reaches a predetermined maximum magnitude irrespective of



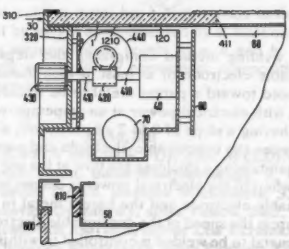
the water level and to close the drain valve when the electrode current falls to a predetermined lower magnitude.

3,944,786

COOKING TRAY WITH CONTROL INDICATOR MEANS

Heinrich Detterbeck, Traunreut, Germany, assignor to Siemens Electrogerate GmbH, Berlin and Munich, Germany

Division of Ser. No. 246,243, April 21, 1972, Pat. No. 3,838,249. This application Sept. 24, 1974, Ser. No. 508,861
Int. Cl.² H05B 3/68
U.S. Cl. 219—453 7 Claims



1. A cooking tray comprising:

a. a cooking unit having at least one heating unit;

b. a carrier member of tempered glass disposed in spaced relation below said cooking unit, said carrier having at least one opening adapted to permit the connection of the cooking unit to the carrier;

c. a sealing means having low thermal conductivity disposed around the circumference of the heating element and connecting the carrier and the heating to thermally insulate the carrier from the heating element;

d. fastening means mounted on the bottom side of the carrier member and passing through the opening in the member to detachably fasten together member and the cooking unit;

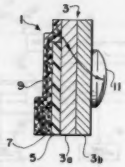
e. a first control element having a first operating control disposed below said carrier and coupled to control said heating element; and

f. a first identification carrier coupled to said first operating control and disposed so as to be visable through said carrier to provide an indication of the position of said first control element.

3,944,787
HEATER ON METAL COMPOSITES

Ernest M. Jost, Plainville, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 26, 1973, Ser. No. 427,891
Int. Cl.² H05B 3/16; H01H 61/02
U.S. Cl. 219—543 3 Claims

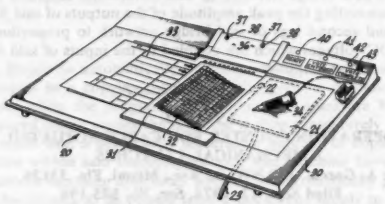


1. A heater unit comprising:
a strip of electrically conductive metal material;
a stripe of an electrically insulative synthetic resin material bonded to a selected limited part of one surface of the metal strip extending along the length of the metal strip exposing a marginal part of said one strip surface also extending along the length of the metal strip;
a stripe of an electrically conductive material bonded to a selected limited part of one surface of the insulative stripe along the length of the insulative stripe exposing a marginal part of said insulative stripe also extending along the length of the insulative stripe adjacent to said exposed marginal part of said one metal strip surface; and
a strip of electrical resistance material overlying and being bonded to a selected part of the electrically conductive stripe, of the exposed marginal part of said insulative stripe, and of the exposed marginal part of said metal strip providing a path of selected electrical resistance between the conductive stripe and said metal strip, whereby, when electrical current flows through said electrical resistance material, heat will be supplied to said metal strip.

3,944,788
VOTE-RECORDING APPARATUS

Gerald G. Comisar, Los Angeles, and Fred L. Carter, Torrance, both of Calif., assignors to Compuvote Corporation, Beverly Hills, Calif.

Filed Jan. 27, 1975, Ser. No. 544,195
Int. Cl.² G07C 13/00
U.S. Cl. 235—54 F 18 Claims

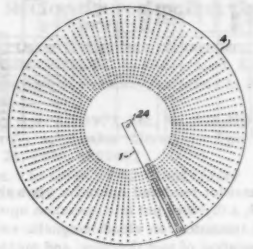


1. For use in an electronic balloting system, vote-recording apparatus for simultaneously providing a permanent, machine-readable record of each ballot and electrical signals indicative of voter selections, said apparatus comprising:
means for holding a ballot record for encoding thereon the voter selections;
electrical sensor matrix means located adjacent the ballot record and having a plurality of elemental sensors corresponding to available ballot selections; and
portable stylus means engageable with said electrical matrix means to selectively actuate same at a particular elemental sensor, thereby producing an electrical signal indicative of a voter selection, said stylus means having ballot record encoding means for simultaneously encoding on the ballot record a voter selection corresponding to said actuated elemental sensor of said electrical matrix means.

3,944,789
PERCENT CALCULATOR

Jon L. Moffat, 1236 - 73rd Ave. SW., Calgary, Alberta, Canada

Filed Mar. 9, 1973, Ser. No. 339,840
Int. Cl.² G06C 27/00
U.S. Cl. 235—78 M 6 Claims



1. A manually operable calculator to calculate per cent scores and to weight test scores comprised of a circular disc, a rule on either side of said disc centrally pivotally fastened to said disc to provide relative movement of three hundred and sixty degrees between said rule and said disc, each side of said disc including an outer circumference of numerals indicating from one to one hundred percent, the radii of the numeral extending inwardly from one hundred per cent comprising a series of numerals representing perfect raw scores, a series of interior circumferences of numerals each corresponding to one perfect raw score, each of said interior circumferences comprising a series of numerals representing test raw scores with one test raw score for each per cent on the outer circumference, each said test raw score on said interior circumference being the numerator, the perfect raw score on the same circumference being the denominator, the percentage score on the outer circumference of the radii of each such test raw score representing the percentage of the test raw score to the perfect raw score, numbers on the rule on each side of the disc representing various perfect scores.

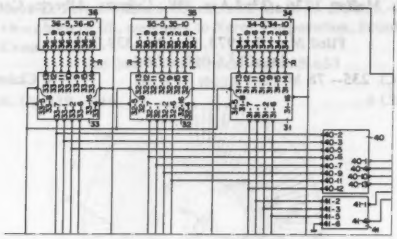
3,944,790
ELECTRONIC DIGITAL TIMER FOR AN ELECTRONIC RANGE

Motokazu Tamano, Yokohama, and Masanobu Yoshioka, Fuji, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1974, Ser. No. 460,465
Claims priority, application Japan, Apr. 16, 1973, 48-42875; Apr. 18, 1973, 48-43977
Int. Cl.² G06M 3/02
U.S. Cl. 235—92 T 11 Claims

1. An electronic digital timer for an electronic range which comprises a time-setting section for defining a desired length of time; a pulse generator for sending forth pulses at a prescribed interval; a counter section for commencing the counting of pulses given forth by the pulse generator as soon as the electronic range begins heating; a time detection section for producing an output when a prescribed relationship arises between the counts made by the counter section and a length of time previously set by the time-setting section; a control device for stopping heating by the electronic range according to an output from the time detection section; the time detection section having a gate circuit for producing an output when a length of time set by the time-setting section is zero; the control device includes a reset switch; a first SCR whose

gate electrode is selectively supplied with outputs from said reset switch, time detection section and gate circuit; a cooking stop switch; a second SCR whose gate electrode is supplied with an output from said cooking stop switch; a cooking start switch; means for forcefully bringing the first and second SCR's into the OFF state upon the closure of the cooking start



switch; a transistor rendered operative upon the actuation of the first SCR; a thyristor put into operation upon the energization of said transistor; an electromagnetic switch energized upon the operation of said thyristor; and means for actuating the power supply circuit of the electronic range upon the actuation of said electromagnetic switch.

3,944,791

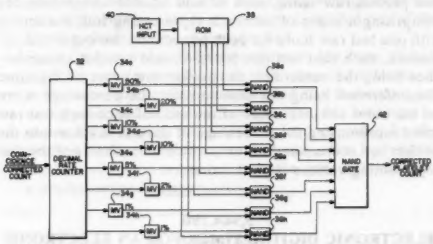
PLATELET COUNT CORRECTION CIRCUIT

Robert Baxter, Jr., Stratford, Conn., assignor to General Science Corporation, Bridgeport, Conn.

Filed July 10, 1974, Ser. No. 486,817

Int. Cl.² H03K *21/34*

U.S. Cl. 235—92 PC **4 Claims**



1. In a platelet counting system including a transducer having an aperture through which platelet-containing liquid is caused to flow, means for generating electrical pulses in response to platelets passing through said aperture, and circuitry for providing correction for the coincident passage of multiple particles through said aperture, circuitry for providing output indication of corrected platelet count comprising:

counter means operative in response to coincidence corrected platelet count to provide a plurality of output signals representative of selected percentages of said coincidence corrected count;

signal representation means for providing signal representations of hematocrit values;

correction factor means operative in response to said signal representations to provide corresponding output signals representative of hematocrit correction values; and

gate means selectively enabled by said output signals from said correction factor means and operative to transmit and combine selected ones of said counter means output signals

to provide an output pulse train representative of corrected platelet count.

3,944,792

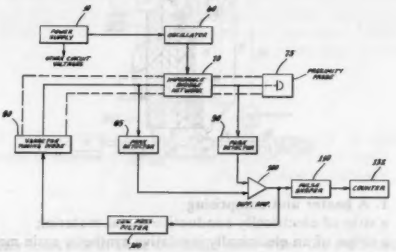
SELF-BALANCING BRIDGE-TYPE PROXIMITY DETECTOR

William J. Sautner, Danbury, Conn., assignor to Jovill Manufacturing Company, Danbury, Conn.

Filed Sept. 11, 1974, Ser. No. 504,905

Int. Cl.² B65H *81/02*

U.S. Cl. 235—92 PK **1 Claim**



1. A self-balancing capacitance bridge-type proximity detector having a probe forming a leg of the bridge for providing an output when a metallic object contacts or passes in close proximity to the probe, comprising in combination

a. a high frequency oscillator,

b. a capacitance bridge network having a proximity capacitance probe in one leg of said bridge network and a varactor effect tuning diode in a second leg of said bridge network, said high frequency oscillator having the output thereof coupled to said first and second legs of said bridge network,

c. a differential amplifier means coupled to said first and second legs of said bridge network for producing an output therefrom on an imbalance of said bridge network caused by a metallic object to be detected contacting or coming into close proximity to said probe,

d. feedback means having a low pass filter which has a time constant producing a time delay in rebalancing said bridge network, said feedback means being coupled between the output of said differential amplifier means and said varactor effect tuning diode for varying the capacitance of said varactor effect tuning diode to rebalance said bridge network, thereby conditioning said bridge network for the next approach of the metallic object to be detected, and

e. peak detector means coupling said first and second legs of said bridge network to said differential amplifier for converting the peak amplitude of the outputs of said first and second legs of said bridge network to proportional DC voltages which are coupled to the inputs of said differential amplifiers.

3,944,793

OPERATION COUNTER FOR CABLE ACTUATED MECHANICAL CLUTCHES

Uville A. Garcia, 130 NW. 62 Ave., Miami, Fla. 33126

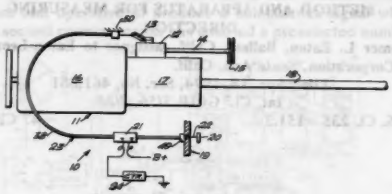
Filed Sept. 12, 1974, Ser. No. 505,198

Int. Cl.² G07C *3/10*

U.S. Cl. 235—92 PD **7 Claims**

1. In a mechanical operation counter for use in association with a flexible slide-wire cable utilized for remotely manually controlling the operation of a mechanical device to which one end of the cable is attached, the slide-wire cable being comprised of an outer sleeve member and a control wire co-axially slideable within the sleeve member, the improvement comprising, a normally open electrical switch, depressable means for momentarily close-circuiting said electrical switch, a slide member secured to the control wire intermediate the ends thereof and moveable in unison with said control wire within a gap defined by a longitudinally extending cut-away portion

of the outer sleeve member of the slide-wire cable, means for fixedly supporting said electrical switch with respect to opposing end portions of the outer sleeve member defining said gap, said slide member comprising abutment means for actuating said switch close-circuiting depressable means as said slide



member moves in unison with the control wire in one direction or the other between the ends of said gap, an electrically actuated counter and an electrical energizing circuit for said counter, said electrical switch being connected in series in said energizing circuit.

3,944,794

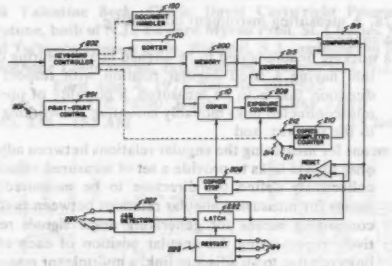
COPYING SYSTEM CONTROL

Edward G. Reehil, Henrietta; James E. Summers, Fairport, and Bhogilal M. Modi, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 5, 1972, Ser. No. 312,411

Int. Cl.² G06B *27/06*

U.S. Cl. 235—92 SB **6 Claims**



1. Means to automatically produce a programmed number of copies in a copying machine in the event a malfunction occurs while the programmed number of copies are being produced which causes the machine to stop prematurely with the result that a not readily discernible number of copies in process within said machine are lost, said machine having a document handling apparatus adapted to automatically present documents to be copied from a document supply to said copying machine to produce the programmed number of copies comprising:

first counter means adapted during machine operation to maintain a running count of copies in process so that in the event of premature stopping of said machine, the number of copies then in process are known;

means to automatically operate said machine in response to said counter means to make up copies lost as a result of said premature stopping to produce the programmed number of copies;

second counter means adapted during machine operation to maintain a running count of documents presented to said copying machine by said document handling apparatus;

third counter means adapted to maintain a running count of the number of documents successfully completely copied by said copying machine;

means to automatically recycle said document handling apparatus to present the document subsequent to the last successfully completed, copied document to said copying machine in the event said document is not in copying position after a premature machine stoppage; and

means to inhibit restarting of said machine until said document is in copying position.

3,944,795

SETTING MECHANISM FOR DIGITAL DISPLAY DEVICES

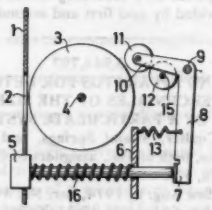
Alfred Meisner; Oskar Oellig, both of Nurnberg; Josef Neubauer, Grossschwarzenlohe, and Bernhard Kratz, Nurnberg-Worzeldorf, all of Germany, assignors to Diehl, Nurnberg, Germany

Filed Apr. 22, 1975, Ser. No. 570,488

Claims priority, application Germany, Apr. 29, 1974, 2420791; Jan. 25, 1975, 2502982

Int. Cl.² G04B *19/02*; G06C *15/42*

U.S. Cl. 235—144 ME **19 Claims**



1. A setting mechanism incorporated in a digital display device which includes a movable first digit carrying means; a motor driving the first digit carrying means in a normal digit-advancing operation; and a movable second digit carrying means; wherein the improvement comprises:

a. a drive member continuously driven by said motor;

b. clutch means connected between said drive member and said second digit carrying means, said clutch means having an engaged and a disengaged state; said clutch means, when in its said engaged state, coupling said drive member to said second digit carrying means for imparting a setting motion to the latter; and

c. manually operable actuating means connected to said clutch means for placing said clutch means from one of its states into the other.

3,944,796

SYSTEM AND METHOD OF RECORDING EVENT INFORMATION FOR SUBSEQUENT ANALYSIS

Lawrence J. Fitzpatrick, 601 University Ave. SE., Minneapolis, Minn. 55414

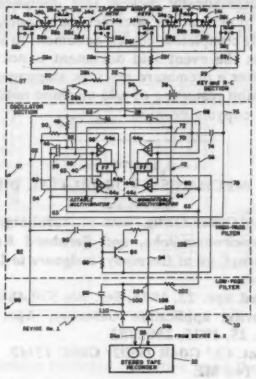
Filed Feb. 7, 1975, Ser. No. 547,815

Int. Cl.² G06F *15/20*; G11B *5/00*

U.S. Cl. 235—151 **20 Claims**

1. In a system for storing information pertaining to events as they are observed, the system comprising a plurality of manually actuatable keys or pushbuttons representative of certain events to be observed, first means providing a sequence of reference pulses having a given repetition rate, second means providing intermediate pulses between at least some of said reference pulses, means controlled by at least one of said keys or pushbuttons for establishing the position of at least some of said intermediate pulses with respect to said reference pulses in accordance with the actuation of a selected key or pushbutton, or selected keys or pushbuttons, in

order to denote one or more of said certain events, and means for recording said signals derived from both said reference and



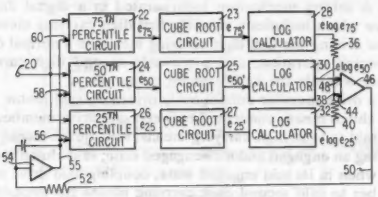
intermediate pulses on a recording medium in the same time sequence provided by said first and second means.

3,944,797

METHOD AND APPARATUS FOR DETERMINING THE CORRECT PERCENTILES OF THE SIZE DISTRIBUTION OF A PARTICULATE SYSTEM

Wallace H. Coulter, Miami Springs, and Walter R. Hogg, Miami Lakes, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Aug. 6, 1974, Ser. No. 495,230
Int. Cl.² G01N *15/02*; G06G *7/12*
U.S. Cl. 235—151.3 **26 Claims**



8. An apparatus for ascertaining a plurality of correct particle sizes within a particulate system below which sizes predetermined fractions of the total mass of the system are respectively included, and wherein the particulate system is passed through a particle detecting device which produces particle pulses proportional to the size of the particles passed therethrough, said apparatus including in combination,

at least first, second and third particle size determing circuits having a common input coupled to the particle detecting device and operative in response to the particle pulses to develop first, second and third particle size signals respectively indicative of first, second and third particle sizes below which sizes first, second and third predetermined fractions of the total mass of the system are included,

combining means coupled to said first and second particle size determining circuits for combining said first and second particle size signals and developing a combined signal therefrom,

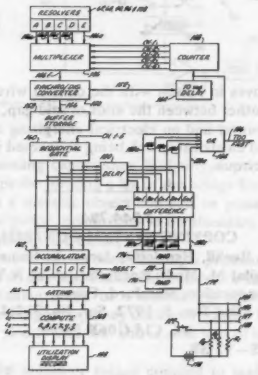
comparison means coupled to said combining means and said third particle size determining circuit and operative to compare said combined signal and said third particle size signal and develop a comparison signal which varies in accordance with the differences therebetween, said first, second and third particle size determining circuits being coupled to said comparison means and operative in response to said comparison signal to vary said first, second and third particle size signals.

3,944,798

METHOD AND APPARATUS FOR MEASURING DIRECTION

Homer L. Eaton, Balboa, Calif., assignor to Eaton-Leonard Corporation, Santa Ana, Calif.

Filed Apr. 18, 1974, Ser. No. 461,881
Int. Cl.² G01B *3/56, 7/28*
U.S. Cl. 235—151.3 **47 Claims**



28. A measuring instrument comprising

a support,

a working head adapted to be aligned in a measuring direction having a fixed angular relation with respect to a direction that is to be measured, a plurality of pivotally interconnected links movably mounting the working head to the support, and

means for measuring the angular relations between adjacent ones of said links to provide a set of measured values that collectively define the direction to be measured, said means for measuring angular relations between said links comprising means for generating angle signals respectively representing the angular position of each of said links relative to an adjacent link, a multiplexor responsive to said angle signals and having an output channel in which the angle sinals sequentially appear, a digital converter responsive to said multiplexor output channel, an accumulator, and means for seqentially gating the output of said converter into said accumulator whereby said accumulator will continuously store the values of said angles as the several links are moved to angularly position the working head.

3,944,799

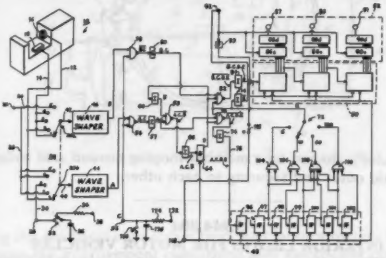
RATIO COMPUTER

Peter Gray Brownell, 741 N. Eastland, Elmhurst, Ill. 60126

Continuation of Ser. No. 221,718, Jan. 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 37,095, May 14, 1970, abandoned. This application Jan. 28, 1974, Ser. No. 437,327
Int. Cl.² G07C *15/00*; G06F *15/30*
U.S. Cl. 235—152 **17 Claims**

1. In a ratio computer for use with a measuring device having transducer means for generating a pulse for each increment of movement of a movable member associated with said measuring device, the combination comprising first bi-directional counter means for counting the pulses from said trans-

ducer, means for rendering said first counter means to count upwardly when said movable member is moving in one direction and for rendering said first counter means to count downwardly when said movable member is moving in an opposite direction, a source of reference pulses, second counter means connected to said source for counting said reference pulses, time base selector means connected to said second counter means and operative to produce a coincidence signal when said second counter means has counted a preselected number



of said reference pulses, indicator means, control means connected to said indicator means, said first counter means and said selector means to cause said indicator means to generate a display related to the number of pulses counted by said first counter means during the interval ending with the production of said coincidence signal, and switch means connected with said first counter means and said second counter means for simultaneously initiating counting by said first and second counter means.

3,944,800

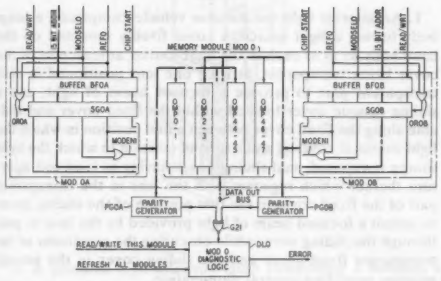
MEMORY DIAGNOSTIC ARRANGEMENT

Frank Valentine Beck, Clark; David Cartwright Peterson, Neptune, both of N.J.; Edward Myron Prell, St. Charles, Ill., and Terrence Thomas Quin, Holmdel, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 4, 1975, Ser. No. 601,522

Int. Cl.[2] G11C *29/00*; **H03K** *13/34*; **G06F** *11/10*

U.S. Cl. 235—153 AM **12 Claims**



1. For use in a memory system wherein a memory module stores a plurality of words, and wherein a source of address information indicates the address of a word to be accessed in said memory module, diagnostic apparatus comprising

first access means responsive to said address information for providing a plurality of control signals to control said memory module to access predetermined bits of said addressed word,

second access means responsive to said address information for providing a plurality of control signals to control said memory module to access the remaining bits of said addressed word,

means connected to both said access means for comparing the control signals provided by said first access means with the control signals provided by said second access means, and

means responsive to said comparing means for generating an error indication if said control signals mismatch.

3,944,801

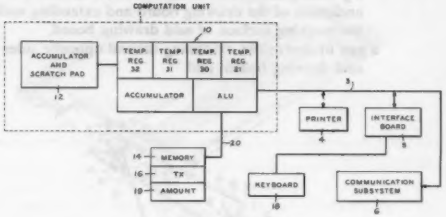
METHOD AND APPARATUS FOR AUTOMATIC SALES TAX COMPUTATION

Richard L. Montana, Stanhope, N.J., assignor to Digital Computer Controls, Inc., Fairfield, N.J.

Filed Sept. 3, 1974, Ser. No. 502,853

Int. Cl.[2] G06F *15/20*

U.S. Cl. 235—156 **6 Claims**



1. An automatic sales tax computer comprising, in combination

an amount register for storing a signal indicative of a taxable amount;

a tax register for storing a signal indicative of an amount of tax;

a memory for selectively providing a signal indicative of a first sum equal to the upper limit of a first range of values, a signal indicative of a second sum equal to a second range of values greater than said first range of values, and signals respectively indicative of successive increments within said first and second ranges of values;

means for accessing the first sum from said memory for comparison to the number in said amount register and for providing a zero output to the tax register when the amount is less than said first sum and for subtracting the first sum from the amount when the amount is greater than the first sum;

means for accessing the second sum from said memory and for dividing the remainder thereby; and

multiplication means for multiplying the whole number quotient of the aforesaid division by a tax amount and entering the result in said tax register, and means for comparing the quotient in sequence to a first increment within the second range and the sum of the first increment and successive increments accessed from said memory and means coupled for incrementing the signal in the tax register for each increment accessed from said memory, and means responsive to the aforesaid comparison for terminating further accessing of increments from the memory when the sum of the first increment and successive increments exceeds the remainder, whereby a signal indicative of the exact tax on the taxable amount is provided in the tax register.

3,944,802

DEVICE FOR SUPPORTING ELONGATED LIGHT FIXTURES ON DRAWING BOARDS

Arne Gustav Edvard Almqvist, Grevegatan 115, S-216 22 Malmo, Sweden

Filed Oct. 15, 1973, Ser. No. 406,363

Claims priority, application Sweden, Oct. 16, 1972, 13301/72

Int. Cl.[2] F21V *33/00*

U.S. Cl. 240—2 D **8 Claims**

1. A device for supporting an elongated light fixture on an inclining drawing board comprising:

a. a bracket means adapted to be mounted on the underside of said drawing board,

a bracket bearing sleeve mounted on said bracket means,

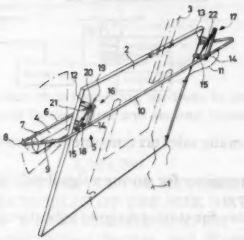
a closed rectangular frame mounted in said bracket bearing sleeve and pivotal around an axis parallel to and at a distance from the underside of said drawing board, and

a light fixture bearing sleeve pivotally mounted on said closed rectangular frame for pivotally mounting said elongated light fixture at a distance from and parallel to the working surface of said drawing board;

said closed rectangular frame comprising:

a first long side journalled in at least one bracket bearing sleeve mounted on said bracket means on the underside of the drawing board and extending under the working surface of said drawing board,

a pair of short sides extending around opposite sides of said drawing board, and



a second long side journalled in at least one light fixture bearing sleeve and extending over and across the working surface of said drawing board;

b. a balancing means operating on said first long side of said closed rectangular frame for maintaining said closed rectangular frame in a set position relative to the working surface of the drawing board and enabling the elongated light fixture to move across the working surface of said drawing board along an arc of a circle, the center of which is positioned at said distance from the underside of said drawing board;

whereby the elongated light fixture, by pivoting in only the bracket bearing sleeve and the light fixture bearing sleeve, maintains its desired angular orientation in relation to the working surface of the drawing board while the closed rectangular frame is rotated through approximately 90° thereby illuminating different portions of the total working surface of the drawing board.

3,944,803

LANTERN SAFETY DEVICE

Albert Chao, Flushing, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Aug. 28, 1974, Ser. No. 501,027

Int. Cl.² F21V *33/00*; **G08B** *5/00*; **H05B** *39/00, 41/00*

U.S. Cl. 240—6.4 W **4 Claims**

1. A latern device adapted to detachably mount onto an animal's collar or a person's belt, which comprises:

a. a bottom transparent flexible plastic strip;

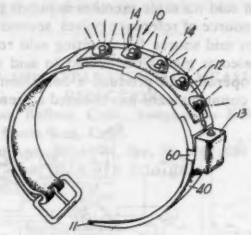
b. a top transparent flexible plastic strip;

c. a plurality of colored light bulbs sealed between said bottom plastic strip and said top plastic strip;

d. an electrical circuit joining said plurality of colored bulbs together;

e. a means for supplying power to said electric circuit; and

f. a means for detachably attaching said latern device to said animal's collar including a plurality of rectangularly shaped members affixed to a bottom surface of said bottom plastic strip, a pair of outer ends of each said rectangularly shaped tape member looping around said collar, said outer end securing to each other.



3,944,804

INTERIOR LIGHTS FOR MOTOR VEHICLES

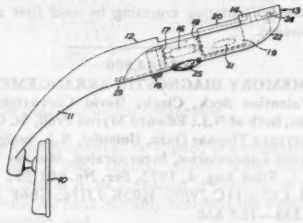
Ronald David Wisdom, Coventry, England, assignor to Chrysler United Kingdom Limited, London, England

Filed Sept. 20, 1974, Ser. No. 507,953

Claims priority, application United Kingdom, Nov. 1, 1973, 50903/73

Int. Cl.² B60Q *1/24, 1/26*

U.S. Cl. 240—7.25 **5 Claims**



1. An interior light for a motor vehicle comprising a lamp body having a light source, a cover fixedly mounted on the lamp body so as to enclose the light source, at least part of the cover being transparent, at least one lens positioned in said transparent part to provide a focused beam of light, and a sliding opaque cover located within the fixed cover and slidable along the fixed cover between a first position in which the light source is covered and a second position in which the light source is exposed, said sliding cover having at least one aperture therein which registers with the lens in the transparent part of the fixed cover in the first position of the sliding cover to permit a focused beam of light provided by the lens to pass through the sliding cover while obscuring the remainder of the transparent fixed cover and the sliding cover in the second position providing general illumination.

3,944,805

WIRELESS ELECTRIC SWIVEL HEAD HAND LANTERN

Arthur H. Moore, Fairfield, Conn., assignor to The Bridgeport Metal Goods Manufacturing Company, Bridgeport, Conn.

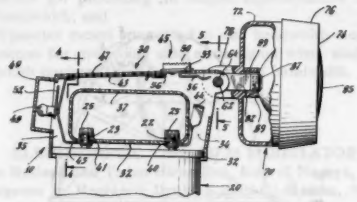
Filed Jan. 24, 1975, Ser. No. 543,884

Int. Cl.² F21L *1/00, 15/00*

U.S. Cl. 240—10.61 **13 Claims**

1. In an improved electrical swivel head hand lantern having a lantern battery, a lantern handle of nonconductive material arranged to be detachably secured to said lantern battery, means for detachably securing said lantern handle to said lantern battery, a swivel head of nonconductive material swivelly secured to said lantern handle, means for swivelly secur-

ing said swivel head to said lantern handle, a lamp supported by said swivel head so as to direct a light beam from said swivel head, means for electrically connecting said lamp to said lantern battery, and a switch means for selectively breaking the electrical connection from said lantern battery to said lamp, the improvement comprising said electrically connecting means consisting entirely of a plurality of conjoined metal strips.



3,944,806

PORTABLE HIGH INTENSITY LAMP

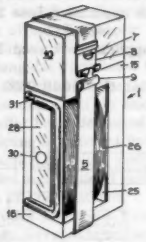
Neal K. Jones, Hove; Aubrey F. W. Langford, Joslin; Donald Anderson, Blair Athol, and Walter R. Crook, Netherby, all of Australia, assignors to The Commonwealth of Australia, Canberra, Australia

Filed July 29, 1974, Ser. No. 492,917

Claims priority, application Australia, July 30, 1973, 4279/73

Int. Cl.² F21L *1/00*; G01R *31/02*

U.S. Cl. 240—10.6 R **10 Claims**



1. A portable high intensity lamp comprising a housing, a lamp with a light source supported by said housing, a battery in said housing to energize the light source of said lamp, a switch relay in said housing to energize and de-energize said light source, circuitry within said housing to activate said switch relay under remote control, and a remote control trigger device and connecting line to said circuitry within said housing but itself arranged to be remotely removably supported in said housing, means to hold said trigger device in said housing during transport, circuit closing means in said trigger device to energize said switch relay through said circuitry in said housing to thereby energize said light source, and test means in said trigger device to cause flow of current insufficient to actuate said switch relay but sufficient to test continuity of said line and establishment of correct operating conditions of said circuitry and light source.

3,944,807

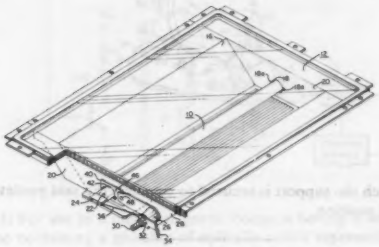
INFRARED LAMP HOLDER

Edsel W. Frantti, Pittsburgh, and Ronald F. Antol, North Huntingdon, both of Pa., assignors to White-Westinghouse Corporation, Cleveland, Ohio

Filed Jan. 20, 1975, Ser. No. 542,314

Int. Cl.² F21L *7/00*

U.S. Cl. 240—11.2 R **5 Claims**



1. Structure for securing a tubular shaped lamp having broad flattened terminal ends within a reflector assembly including opposed end walls defining apertures generally conforming to the tubular portion of the lamp and including notches for receipt therethrough of said terminal ends, said terminal ends being spaced from said end walls in said secured position, said structure comprising:

a post member mounted on said assembly generally adjacent each terminal end of said lamp;

a lead wire attached to said terminal end and connected to said post member, said wire being generally taut between said lamp and said post to prevent excessive axial movement of said lamp and also maintain said terminal ends in a predetermined angular orientation with respect to said notches in said aperture;

a sheet of insulating material interposed between said terminal end and said end wall, said sheet defining an aperture including notches generally coextensive with the aperture in said end wall; and,

means for retaining said sheet in said position against said end wall and with the notches in the aperture therein at an angular orientation distinct from the angular orientation of the associated terminal end of said lamp whereby the terminal end and end wall are electrically shielded from each other by said sheet.

3,944,808

LAMP MOUNTING ASSEMBLY

Arthur Samuel Vause, London, England, assignor to Thorn Electrical Industries Limited, London, England

Filed Sept. 3, 1974, Ser. No. 502,883

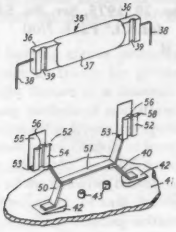
Claims priority, application United Kingdom, Sept. 7, 1973, 42256/73

Int. Cl.² F21V *21/00*

U.S. Cl. 240—52 R **4 Claims**

1. A lighting unit comprising a lamp having an envelope with a seal structure at one end of the envelope, a reflector, and a support mounting the lamp in a predetermined position with respect to the reflector, said support comprising a holder clasping the said seal structure, said holder and said seal structure having interlocking rib and groove means extending transverse to the axis of the lamp and locating the lamp against axial displacement and said holder and said seal structure being formed with abutment surfaces to locate the lamp

against displacement in directions transverse to the axis, said reflector having integral protrusions on the reflecting surface



to which the support is secured to establish the said predetermined position.

3,944,809

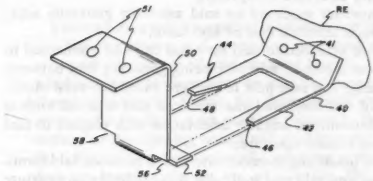
LUMINAIRE WITH MOUNTING MEANS

William Cooper Moore; John David Kiss, and John Richard Dean, all of Memphis, Tenn., assignors to International Telephone & Telegraph Corporation, New York, N.Y.

Filed June 19, 1974, Ser. No. 480,617

Int. Cl.² F21V *17/00*

U.S. Cl. 240—73 R **5 Claims**



1. A luminaire having one end adapted to mount on a vertical mast spaced from an area to be illuminated, said luminaire comprising an enlarged main housing having a surround wall generally downwardly-facing to form an open mouth defining the rim of said main housing, an inverted bowl-shaped reflector having a rim portion extending out of said mouth at an end remote from said one end, a bowl-shaped refractor housing hinged to said housing at said end remote from said one end, said refractor housing including a refractor affixed to said refractor housing configured to close the open mouth of said housing, means for releasing said refractor housing to cause said refractor housing to depend from said remote end to partially uncover said mouth for access to the interior of said main housing, a reflector mounting bracket recessed in said main housing adjacent the remote end thereof, said bracket comprising a depending wall and an end wall stepped from said depending wall with said walls inset in said main housing, a forked member affixed to said reflector intermediately along the bowl shape thereof for mating with said bracket to position said reflector in said main housing, said bracket end wall defining a landing surface for retaining thereon said forked member as the reflector is advanced into said main housing, and notches in said depending wall for receiving said forked member in a tight-fitting relationship to locate and to hold said reflector relative to the remote end of said main housing and relative to sides of the wall thereof.

3,944,810

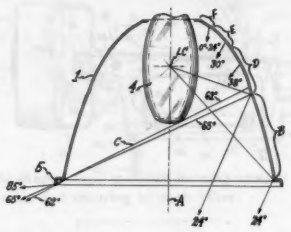
LUMINARE

James L. Grindle, Hendersonville, N.C., assignor to General Electric Company, N.Y.

Filed Feb. 18, 1975, Ser. No. 550,209

Int. Cl.² F21V *7/14*

U.S. Cl. 240—103 R **10 Claims**



1. A luminaire comprising, in combination, a concave reflector having a top and a bottom and formed by a wall extending about an axis and having a rim defining a bottom opening, and a lamp mounted in said reflector and having a light center substantially on said axis, said lamp arranged so that a straight line between and tangent to said rim and the bottom of said lamp form a vertical cut-off angle of not more than about 65°relative to said axis, said reflector having an inner reflecting surface portion extending a substantial distance upwardly from said rim and formed to reflect substantially all the light incident thereon from said light center downwardly at a vertical angle relative to said axis of not more than about 50% of said cut-off angle.

3,944,811

DIELECTRIC WAVEGUIDES

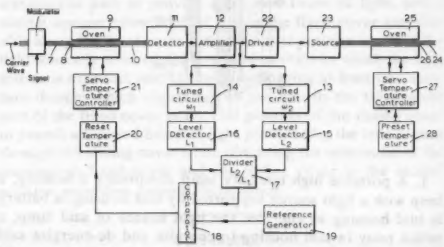
John Edwin Midwinter, Woodbridge, England, assignor to The Post Office, London, England

Continuation-in-part of Ser. No. 363,527, May 24, 1973, Pat. No. 3,841,731. This application June 27, 1974, Ser. No. 483,832

Claims priority, application United Kingdom, June 14, 1972, 27854/72

Int. Cl.² H04B *9/00*

U.S. Cl. 250—199 **7 Claims**



1. A mode limiter for use in an optical communications system in which signals are modulated on to a light beam transmitted over a multi-mode dielectric optical waveguide, including more trimmer means, through which said light beam can propagate in only a limited number of modes, to a detector, said signals having a bandwidth after detection determined by said number of modes, said mode limiter comprising:

mode trimmer means including a section of liquid cored dielectric optical waveguide whose temperature determines said number of modes;

control means for varying the temperature of said guide to vary the number of modes propagating through said trimmer means in response to an error signal;

an optical detector for extracting said signals from said light beam after said light beam has propagated through said mode eliminator means;

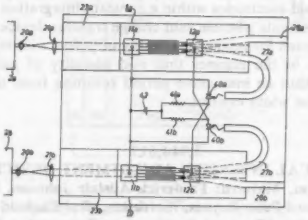
bandwidth measuring means connected to said optical detector for producing an output representative of said bandwidth; and

comparator means connected to said bandwidth measuring means for producing said error signal when said bandwidth deviates from a predetermined bandwidth.

3,944,812
ELECTROOPTIC THIN-FILM MODULATOR

Shuzo Hattori, and Tadao Hiramatsu, both of Nagoya, Japan, assignors to Hagiwara Denki Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 8, 1974, Ser. No. 449,545
Claims priority, application Japan, Mar. 8, 1973, 48-27343
Int. Cl.² G01J 1/20; G02B 5/14; G02F 1/32
U.S. Cl. 250—201 **11 Claims**



1. An electrooptic modulator comprising:

a light waveguide of an electrooptic crystalline composite structure including a substrate having a surface of a plane defined by rectangular coordinate first and second axes, a light transmissible thin-film per se having an electrooptic property and deposited on said surface of the substrate, and a buffer layer deposited on said thin-film;

a light source emitting a coherent light beam;

an input light coupler coupling said coherent light beam into said thin-film as a mode of guided wave propagating in the direction of said first axis;

interdigital electrodes engraved from a deposited metal layer on said light waveguide to cause therein an electric field which has spatial periodicity larger than the total thickness of said thin-film and buffer layers in the direction of said second axis and uniform in the direction of said first axis;

a voltage source connected to said electrodes to apply thereto a modulating signal voltage; and

an output light coupler coupling the propagated light wave out of said waveguide, the coupled out light being diffracted into orders.

4. An electrooptic modulator as claimed in claim 1, which further comprises:

means to selectively pass one of the diffracted orders.

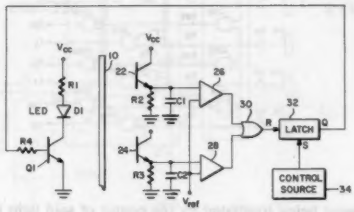
5. An electrooptic modulator as claimed in claim 4, which further comprises:

a photo-detector receiving an original pulsed light beam and generating a voltage responsive thereto, which voltage, once applied to said electrodes, produces a pulsed change in the output beam in said selected order which is larger than the change of said original pulsed light beam.

3,944,813
PHOTOELECTRIC CONTROL CIRCUIT FOR DIGITAL MAGNETIC COMPASS

John T. Fowler, Winthrop, Mass., assignor to The Laitram Corporation, New Orleans, La.

Filed Aug. 8, 1974, Ser. No. 495,849
Int. Cl.² G01D 5/34; G01J 1/32
U.S. Cl. 250—205 **5 Claims**



1. For use in a digital magnetic compass having a compass disc containing a plurality of optically coded representations of compass headings thereon, means for illuminating a selected portion of said disc, and photosensor means for providing electrical signals representative of compass headings, a photoelectric control circuit comprising:

an illumination source;

at least one photosensor receiving light from said source and through said disc;

comparator means receiving an electrical signal from said at least one photosensor and a reference voltage and providing a digital output signal of one level when said photosensor signal is less than said reference voltage and of another level when said photosensor signal is at least equal to said reference voltage; and

latch means operative in response to said digital output signal from said comparator means to provide an energizing signal to said illumination source from a start time until switching of said comparator means from said one level to said another level thereby to energize said illumination source only for a duration sufficient to permit detection of a photosensor signal at least equal to said reference voltage;

said latch means providing no energizing signal to said illumination source from said switching of said comparator means until the next start time.

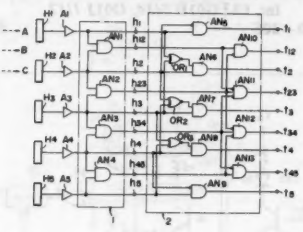
3,944,814
LIGHT DETECTING APPARATUS OF IMPROVED RESOLUTION

Koichi Goto, Hiratsuka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed June 14, 1974, Ser. No. 479,584
Claims priority, application Japan, June 18, 1973, 48-68539
Int. Cl.² H01J 39/12
U.S. Cl. 250—209 **3 Claims**

1. A light detecting apparatus of improved resolution comprising a plurality of light receiving elements arranged at a predetermined relative spacing in a row and producing detection output signals when said light receiving elements receive light, means for projecting a light beam upon said light receiving elements, a plurality of sequentially ordered logical produce circuits, each of said logical product circuits provided for every pair of adjacent light receiving elements and connected to receive the detection output signals of said pair of adjacent light receiving elements to produce an output signal only when said pair of adjacent light receiving elements are simultaneously irradiated by said light beam, wherein said detection output signals and output signals of said logical product circuits are an odd number of sequentially ordered signals, and a detection signal selection circuit connected to said light

receiving elements and to said logical product circuits to respond to said detection output signals and said output signals of said logical product circuits to select from one of said plurality of light receiving elements said one light receiving



element being irradiated by the center of said light beam, by selectively gating out a center signal of said odd number of sequentially ordered signals of said detection output signals and said output signals of said logical product circuits.

3,944,815

FIRING APPARATUS FOR A PLURALITY OF ELECTRIC VALVES

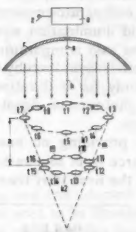
Oskar Beckmann, St. Polten; Adolf Habock, Uttenreuth, and Karl-Friedrich Leowald, Weiher, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 29, 1974, Ser. No. 528,491

Claims priority, application Germany, Dec. 5, 1973, 2360645

Int. Cl.² H03K 17/78

U.S. Cl. 250—209 **19 Claims**



1. In a firing device for a plurality of electric valves comprising a plurality of detectors for electromagnetic radiation each forming an input to a firing circuit coupled to a valve said electric valves being electrically coupled in at least one circuit, all valves being required to be simultaneously fired, the firing device also including a transmitter coupled to means providing thereto a firing control signal, said transmitter being equipped with a radiator which directs energy toward the plurality of detectors for the individual valves, said individual detectors being arranged so as to be able to intercept the radiation from the radiator to permit firing of the valves without a wired connection, the improvement comprising:

a. the radiating device being designed to generate substantially parallel rays of electromagnetic radiation; and

b. the plurality of detectors for electromagnetic radiation being arranged spacially displaced relative to each other such that each is exposed to the parallel ray beam from said radiating device without mutual shadowing when all of said detectors are projected onto a plane perpendicular to the direction of radiation as viewed in the direction of radiation.

3,944,816

CHARGE TRANSFER APPARATUS HAVING LIGHT SENSITIVITY CONTROL MEANS

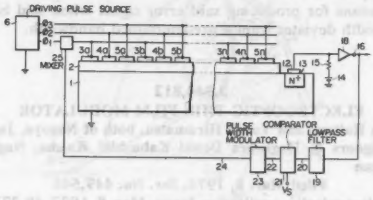
Nozomu Harada, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 2, 1974, Ser. No. 511,266

Claims priority, application Japan, Oct. 3, 1973, 48-110477

Int. Cl.² H01J 39/12

U.S. Cl. 250—211 J **3 Claims**



1. In a system for light sensitivity control of an image pickup device comprising a charge transfer device which comprises a plurality of electrodes provided on a semiconductor substrate in a manner insulated therefrom and means for controlling the light sensitivity of said image pickup device by controlling the width of an integrating pulse supplied from a driving voltage source to said electrodes within a constant integration period, the improvements wherein said charge transfer device further includes means for mixing a plurality of pulses with said driving voltage in the manner that said plurality of pulses are inserted within an insensitive period resulting from the integration pulse width control.

3,944,817

OPTICAL INTENSITY ADJUSTMENT DEVICES

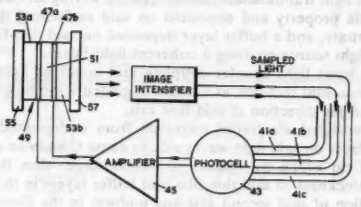
Cyril Hilsum, Malvern; Frederick Alistair Johnson, Powick, and Edward Peter Raynes, Worcester, all of England, assignors to National Research Development Corporation, London, England

Filed Nov. 8, 1973, Ser. No. 414,097

Claims priority, application United Kingdom, Nov. 9, 1972, 51697/72

Int. Cl.² H01J 31/50

U.S. Cl. 250—213 VT **11 Claims**



1. An optical intensity adjustment device for adjusting the intensity of optical radiation incident thereon comprising a first transparent conducting electrode, a second transparent conducting electrode, a layer of a twisted nematic liquid crystal material contained between said first electrode and said second electrode, an optical polarization polarizer located adjacent to said first electrode for linearly polarizing optical radiation incident on said layer via said first electrode, an optical polarization analyzer located adjacent to said second electrode for analyzing the plane of polarization of optical radiation emergent from said layer, means for applying a voltage between said first electrode and said second electrode and, electrically connected to said means for applying a voltage, photoelectric means for sampling and providing adjustment of the intensity of optical radiation falling on said device,

said photoelectric means comprising a photoconductive layer formed from a multiplicity of islands of a photoconductive material so physically disposed with respect to said layer of liquid crystal material that when optical radiation is incident on a localized region of said device said radiation causes the electrical resistance of said photoconductive layer in said localized region to fall and consequently causing said voltage to be applied mainly across said layer of liquid crystal material in said localized region to adjust the plane of polarization of said radiation in said localized region and reduce the intensity transmitted by said analyzer in said localized region.

3,944,818

PHOTOELECTRIC GUARD

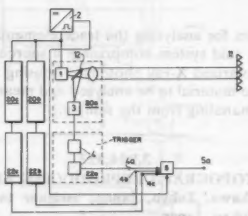
Klaus Bechtel, Osthofen, Germany, assignor to Visomat-Gerate GmbH, Mainz, Germany

Continuation-in-part of Ser. No. 344,551, March 26, 1973, abandoned. This application Sept. 17, 1974, Ser. No. 506,837

Claims priority, application Germany, Mar. 28, 1972, 2215136

Int. Cl.² G01D 21/04

U.S. Cl. 250—221 **5 Claims**



1. A photoelectric guard barrier comprising:

a pulse generator for providing a train of binary pulses;

a plurality of luminescence diodes connected to said pulse generator so as to emit, respectively, light output pulses in response to the output pulses of said generator;

a plurality of photo-receivers the number of which is equal to the number of said luminescence diodes, each of said photo-receivers being operatively arranged to receive said light output pulses from respective ones of said luminescence diodes and providing output signals representative thereof;

a trigger circuit for each photo-receiver providing a one output when each said photo-receiver senses light and providing a signal above a preselected threshold;

a NAND-gate having one input coupled to the pulse generator and remaining inputs coupled respectively to each said trigger circuit, said NAND-gate providing a O output when said trigger circuits and said pulse generator simultaneously provide a one output;

an OR-gate having one input connected to said pulse generator and remaining inputs connected respectively to each said trigger circuit, said OR-gate providing a one output when either said pulse generator provides a one output or any of said trigger circuits provides a one output;

a master slave flip-flop coupled to said NAND and said OR-gate, a O output from said NAND-gate setting the normal output of said flip-flop into a one state and a one output from said OR-gate resetting the normal output of said flip-flop into the O stage;

said master slave flip-flop providing a one output when all said photo-receivers sense bright from said light output pulses and a O output when all said photo-receivers sense dark during the intervals between said light output pulses;

said flip-flop being neither set nor re-set when light does not reach at least one of said photo-receivers and said generator pulse is present or when at least one photo-receiver senses light and said generator pulse is absent, thereby providing a constant output.

3,944,819

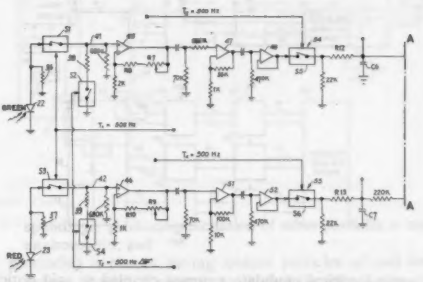
PRODUCE GRADER

John R. Sherwood, Arlington, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed Feb. 26, 1975, Ser. No. 553,362

Int. Cl.² B07C 5/342

U.S. Cl. 250—226 **6 Claims**



5. In a produce grader or the like having detector means for producing at least first and second d.c. signals corresponding to respective detected characteristics of an article of produce being graded, wherein the produce grader includes first and second respective signal paths for said two d.c. signals, wherein each signal path includes chopper means for chopping the d.c. signal into an a.c. signal, a.c. amplifier means for amplifying the a.c. signal, and means including synchronous detector means for reconverting the amplified a.c. signal to a d.c. signal, and wherein the reconverted d.c. signals in the signal paths are compared and/or evaluated according to a desired calibration to form a basis for grading an article, the improvement of adjustable calibration means for simply and reliably adjusting the calibration of the grader, said improvement comprising

gating signal generating means for generating at least a first gating signal for controlling said chopper means in said signal paths and for generating second and third gating signals for controlling said synchronous detector means in the respective signal paths,

said gating signal generating means including means for adjusting the time duration of at least one of said second and third gating signals, whereby the magnitude of at least one of said reconverted d.c. signals may be changed as a function of the duty cycle of its respective synchronous detector gating signal, thereby to change the calibration of said produce grader.

3,944,820

HIGH SPEED OPTICAL MATRIX MULTIPLIER SYSTEM

Larry B. Stotts, Chula Vista, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 12, 1975, Ser. No. 576,773

Int. Cl.² G02F 1/01; G02B 5/17

U.S. Cl. 250—227 **6 Claims**

1. A high-speed optical matrix multiplier system for performing matrix-vector multiplication of the form

$((A_{M,N}))\ B_{N,1} = C_{M,1}$

where

$A_{M,N} = M \times N$, representative of a linear matrix operator

$B_{N,1} = N \times 1$, representative of a column vector input

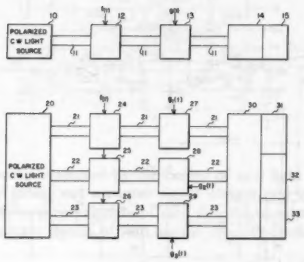
$C_{M,1} = M \times 1$, representative of a column vector processed output

comprising:

M number of optical waveguides for transmitting continuous wave, polarized light energy;

a source of continuous wave, polarized light energy arranged to transmit its output along the optical paths defined by said optical waveguides;

first optical modulating means coupled to said optical waveguides and responsive to a column vector type input signal for temporally modulating the light energy transmitted;



second optical modulating means coupled to said optical waveguides and responsive to a row vector type input signal for temporally modulating the light energy transmitted by said optical waveguides,

a polarization analyzer for converting the resultant modulations in polarization and phase of light energy to commensurate intensity modulations for each optical waveguide; and

a photo-responsive detector disposed to receive and cumulatively store the modulated light energy output of each optical waveguide over a time period synchronous with the time periods of said column vector type input signal and said row vector type input signal.

3,944,821

DETECTION OF ANGULAR POSITION

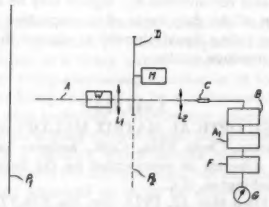
Jean Joseph Henri Pierrat, Versailles, France, assignor to Societe Avions Marcel Dassault -Brequet Aviation, Paris, France

Filed June 24, 1974, Ser. No. 482,761

Claims priority, application France, July 4, 1973, 73.24563

Int. Cl.² G01B *11/26*

U.S. Cl. 250—237 G **21 Claims**



1. A device for detecting a direction, comprising a grating having parallel bars orientated in the direction to be detected, a continuously rotating disc having alternately light and dark radii, means for forming an image of the grating on the disc, thereby producing morie figures, means for sensing the average light intensity modulation on the superimposed grating image and disc, and optical means for rotating said grating image around an axis parallel to the axis of disc rotation from a first, initial angular position to a second angular position, at which a peak amplitude is sensed by said light intensity modulation sensing means, said second angular position being indicative of the direction to be detected.

3,944,822

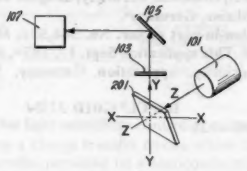
POLARIZATION EXCITATION DEVICE FOR X-RAY FLUORESCENCE ANALYSIS

Thomas G. Dzubay, Durham, N.C., assignor to The United States of America as represented by the Administrator of the U. S. Environmental Protection Agency, Washington, D.C.

Filed Sept. 30, 1974, Ser. No. 510,188

Int. Cl.² G21F *3/02*; G21K *1/00*, *3/00*; G01N *23/20*

U.S. Cl. 250—272 **10 Claims**



1. A system for analyzing the trace elemental composition of a sample, said system comprising: a source of monochromatic and polarized X-ray photons, a housing for mounting a sample of the material to be analyzed and means for detecting the X-ray emanating from the sample.

3,944,823

X-RAY TOPOGRAPH REPRODUCING APPARATUS

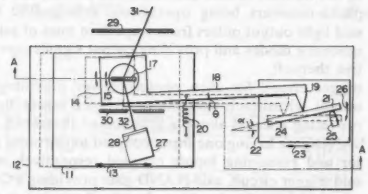
Junichi Chikawa, Tokyo, Japan, assignor to Nippon Hoso Kyokai, Tokyo, Japan

Continuation of Ser. No. 325,414, Jan. 22, 1973, abandoned, which is a continuation of Ser. No. 123,726, March 12, 1971, abandoned. This application July 15, 1974, Ser. No. 488,682

Claims priority, application Japan, Mar. 16, 1970, 45-21613; Apr. 23, 1970, 45-34516; Apr. 23, 1970, 45-34517

Int. Cl.² G01M *23/20*

U.S. Cl. 250—274 **5 Claims**



1. An X-ray topograph reproducing apparatus comprising

an X-ray source which emits two characteristic X-rays $K\alpha_1$ and $K\alpha_2$ whose wave lengths are different from each other,

means for supporting a specimen to be observed and for moving said specimen in a direction such that the distance between the X-ray source and the surface of the specimen is kept nearly constant,

a first slit fixedly arranged between said X-ray source and said specimen supporting means, said slit for allowing passage of an incident beam to the specimen which beam is divergent enough for satisfying the Bragg reflection condition for both the $K\alpha_1$ and $K\alpha_2$ radiations,

means for supporting a record medium substantially perpendicular to the characteristic radiations $K\alpha_1$ and $K\alpha_2$ diffracted from the specimen and for moving said record medium in synchronization with said specimen,

a second slit fixedly arranged between said specimen supporting means and said record medium supporting means so that both of the characteristic X-rays $K\alpha_1$ and $K\alpha_2$ diffracted from said specimen can pass through said second slit, and

means for mechanically interlocking said specimen and record medium supporting means and for moving them in proportion with respect to each other such that the characteristic radiations $K\alpha_1$ and $K\alpha_2$ diffracted by a point in the specimen are superimposed on the surface of the record medium.

3,944,824

METHOD AND DEVICE FOR SAMPLING GASES

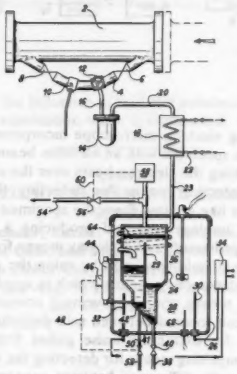
Jean Chagny, Lyon; Guy Francoise, Jardin, and Daniel Thevenet, Bron, all of France, assignors to Entreprise de Recherches et d'Activites Petrolieres Elf, Paris, France

Filed Sept. 17, 1974, Ser. No. 506,722

Claims priority, application France, Sept. 21, 1973, 73.33933

Int. Cl.² B01D 59/44

U.S. Cl. 250—288 **8 Claims**



1. A method for continuous sampling of a mixture of a multiphase fluid for the analysis of gaseous compounds of said mixture which have a mass below a given value, comprising the steps of continuously withdrawing a portion of said mixture from a main flow circuit for said mixture, to a sampling circuit under conditions of pressure such that the Reynolds numbers within the main circuit and the sampling circuit are equivalent, removing the dust from said mixture portion, passing said mixture portion in a heat exchange relation with a heat exchange fluid at a predetermined temperature, collecting the condensed and gaseous fractions of the mixture portion in a flash drum at a predetermined temperature and passing to an analytical instrument the products of said mixture portion whose mass is such that said products are present in gaseous form at said latter predetermined temperature.

3,944,825

METHOD AND APPARATUS FOR THE SEPARATION OF ISOTOPES

Richard H. Levy, Boston, and George Sargent Janes, Lincoln, both of Mass., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Continuation-in-part of Ser. No. 25,605, March 25, 1970, Pat. No. 3,772,519. This application Feb. 2, 1973, Ser. No. 328,953

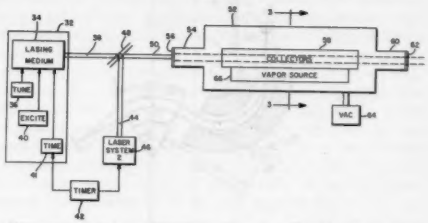
Int. Cl.² H01J 39/34

U.S. Cl. 250—282 **41 Claims**

1. In a technique for isotope separation, a process for generating a super energetic plasma of ionized particles of one isotope type and corresponding electrons in an environment of plural isotope types having a predetermined path of flow, said process including the steps of:

applying radiant energy to said environment of plural isotopes including said one isotope type;

the energy of said applied radiant energy corresponding to a selected transition for said particles of said one isotope type to produce excitation thereof to an intermediate excited level below the level of ionization without correspondingly producing excitation of other particles in said environment; and



generating a plasma having ionized particles of said one isotope type and electrons released therefrom, the released electrons having a kinetic energy substantially in excess of the background energy of said environment to provide expansion of said electrons and resulting expansion of the ionized particles of said one isotope type in said environment onto trajectories distinct from the path of flow of the particles in said environment.

3,944,826

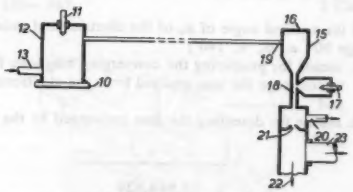
METHODS AND APPARATUS FOR ANALYZING MIXTURES

Alan Lyle Gray, Harpenden, England, assignor to Applied Research Laboratories Limited, England

Continuation-in-part of Ser. No. 380,762, July 19, 1973, abandoned. This application Nov. 25, 1974, Ser. No. 526,952

Int. Cl.² H01J 39/34

U.S. Cl. 250—288 **7 Claims**



1. A method of analyzing a material which comprises the steps of:

a. providing a gaseous medium;

b. introducing said material into said medium;

c. ionizing at least part of said medium in a first region to convert it to a plasma state, and thereby ionize said introduced material, with said plasma at substantially atmospheric pressure and substantially in a condition of thermal equilibrium;

d. transferring a portion of said gaseous medium containing said ionized material to a second region at a pressure substantially lower than the pressure in said first region; and

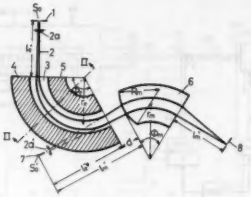
e. transferring said ionized material from said second region to a mass analyzer.

3,944,827

VIRTUAL IMAGE TYPE DOUBLE FOCUSING MASS SPECTROMETER

Hisashi Matsuda, Takarazuka, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1974, Ser. No. 498,078
Claims priority, application Japan, Aug. 21, 1973, 48-93749
Int. Cl.² B10D 59/44
U.S. Cl. 250—298 3 Claims



1. A double focusing mass spectrometer incorporating a diverging electrostatic field and a converging magnetic field through which an ion beam to be analyzed passes comprising:

a. an ion source for producing an ion beam;

b. inner and outer electrodes for producing the diverging electrostatic field, positions within said field being defined by the cylindrical coordinates r, ϕ and z, the central ion orbit having a radius r_e in the $z=0$ plane, equipotential lines within said field in the $z=0$ plane being defined by a particular value of r, equipotential lines within said field in an r-z plane which contains the z axis and thereby being perpendicular to the central ion orbit being defined by a radius R, said field satisfying the condition

$$\frac{dR}{dr} < 0,$$

the ratio of the radius r_e of the central ion orbit and R_e being the radius of curvature of an equipotential line in the r-z plane passing through the central ion orbit satisfying the following range

$$2.4 \leqslant r_e/R_e \leqslant 3.0$$

and the vertical angle of ϕ_e of the electric field satisfying the range $90° \leqslant \phi_e \leqslant 140°$;

c. means for producing the converging magnetic field so as to converge the ions emitted from the electrostatic field; and

d. means for detecting the ions converged by the magnetic field.

3,944,828

HYDROPHOBIC POWDERED DEVELOPER FOR FLUORESCENT PENETRANT INSPECTION

Adolf Miotfijalkowski, Lincolnwood, Ill., assignor to Magnaflux Corporation, Chicago, Ill.

Filed Sept. 30, 1974, Ser. No. 510,396
Int. Cl.² G01N 21/16
U.S. Cl. 250—302 7 Claims

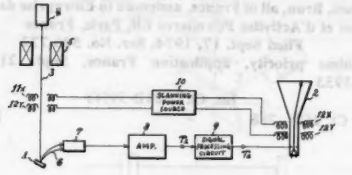
1. The method of detecting surface discontinuities in a part which comprises applying a fluorescent penetrant to said part to permit said penetrant to enter and become lodged in surface discontinuities, applying an emulsifying agent to said part to emulsify excess penetrant, washing the part with water to remove emulsifying agent and emulsified penetrant while leaving penetrant lodged in said discontinuities, and while the surface of said part is still moist, applying particles of a dry hydrophobic developer over said part, removing excess developer, and thereafter inspecting said part for penetrant exuded out of said discontinuities and into said particles.

3,944,829

METHOD AND APPARATUS FOR PROCESSING A VIDEO SIGNAL FROM A SCANNING ELECTRON MICROSCOPE

Masayuki Sato, Akishima, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1974, Ser. No. 454,808
Claims priority, application Japan, Mar. 27, 1973, 48-35285
Int. Cl.² H01K 37/26
U.S. Cl. 250—311 1 Claim



1. A scanning electron microscope incorporating a means for irradiating a specimen with an electron beam, a deflecting means for scanning the electron beam over the surface of said specimen, a detecting means for detecting the secondary electrons or the like emitted from the specimen as a result of electron beam impingement and producing a pulsed video signal indicative thereof, and a display means for displaying a scanning image of said specimen by using the pulsed output signal from said detecting means which is synchronized with said deflecting means, the improvement comprising a signal processing circuit located between said detecting means and display means for extracting noise pulses from the pulsed video signal comprising means for detecting the absolute value of the pulse height difference between successive pulses of said pulsed video signal and means for rejecting video pulse signals when the absolute value of the pulse height difference exceeds a selected value twice in succession.

3,944,830

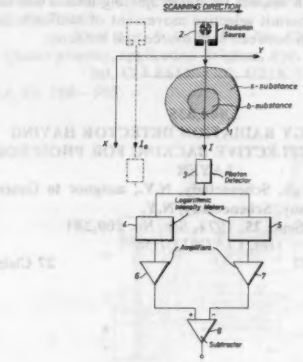
METHOD OF AND AN APPARATUS FOR EXAMINING A SAMPLE OR A MATERIAL BY MEASURING THE ABSORPTION OF γ- OR X-RAY RADIATION

Erik Dissing, Nykoping, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed May 10, 1974, Ser. No. 469,009
Claims priority, application Sweden, May 11, 1973, 7306721
Int. Cl.² G01N 23/02
U.S. Cl. 250—358 R 18 Claims

1. A method of examining a sample of biological tissue, which sample includes at least two different substances, by measuring the absorption of electromagnetic radiation, the method comprising the step of: transmitting electromagnetic radiation including photons of at least two different energies through the sample; simultaneously determining, for each of two predetermined photon energies, the logarithm of the radiation intensity of the radiation passed through the sample; processing the logarithmic values obtained so that the ratio of said values is changed by a predetermined factor substantially equal to the ratio between the mass absorption coefficient of one of said substances at the second photon energy and the mass absorption coefficient of said one substance at the first

photon energy; and subtracting the logarithmic values thus processed from each other in order to obtain a simultaneous



value so that the influence of said one substance on the magnitude of the examination value is eliminated.

3,944,831

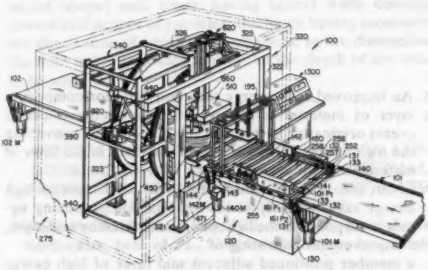
TIRE INSPECTION SYSTEM WITH SHIELDED X-RAY SOURCE

Donald N. Heisner, Euclid; Anthony Palermo, Jr., South Euclid, both of Ohio, and Phillip K. Loyer, Waynesville, N.C., assignors to Picker Corporation, Cleveland, Ohio

Filed Aug. 7, 1974, Ser. No. 495,447

Int. Cl.² G01N 23/00

U.S. Cl. 250—358 T **19 Claims**



1. An X-ray tire inspection apparatus comprising:

a. a radiation shielded enclosure including at least one movable radiation-shielded door for shielding an opening formed through a sidewall of said enclosure and for admitting a tire to be inspected through said opening into said enclosure;

b. a source of X-radiation movably mounted in said enclosure and movable between an inspection position and a retracted position;

c. radiation shielding means for receiving said source when said source is in said retracted position to block the emission of X-radiation from said source through said opening; and,

d. safety means for retaining said source in said retracted position when said door is open.

3,944,832

SCINTILLATION SPECTROMETER

Yehoshua Kalish, 98 Tzahal Str., Kiron, Israel

Filed Feb. 28, 1974, Ser. No. 446,777

Int. Cl. G01t 1/20

U.S. Cl. 250—361 **11 Claims**

1. A scintillation spectrometer comprising an inorganic scintillation crystal, said crystal being characterized by a well situated therein wherein the inner surfaces of said well are coated with a light transmitting material whereby said spectrometer is adapted to measure both beta and gamma emissions of radioactive samples introduced into said well.

3,944,833

APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION

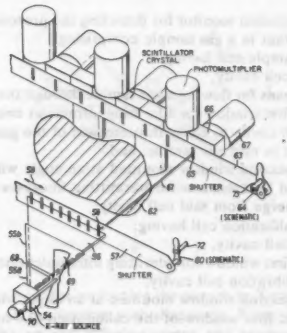
Godfrey Newbold Hounsfield, Newark, England, assignor to E M I Limited, Hayes, England

Division of Ser. No. 349,198, April 9, 1973, Pat. No. 3,866,047, which is a continuation-in-part of Ser. No. 212,778, Dec. 27, 1971, Pat. No. 3,778,614, which is a continuation of Ser. No. 861,538, Aug. 21, 1969, abandoned. This application May 7, 1974, Ser. No. 468,005

Claims priority, application United Kingdom, Aug. 23, 1968, 40317/68

Int. Cl.² G01T 1/20

U.S. Cl. 250—367 **2 Claims**



1. Apparatus for examining a body by means of penetrating radiation, such as X- or γ - radiation, including source means for producing a substantially planar, sectoral-shaped swath of radiation directed towards the body, the plane of the swath being arranged to define a plane of interest in the body, detector means disposed to receive radiation emergent from the body, the source means and the detector means being dis-

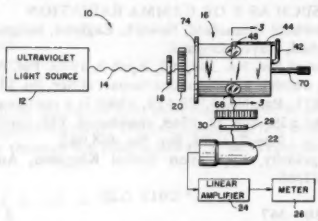
posed on opposite sides of an aperture in which the body can be inserted, collimator means disposed between the source means and the detector means and having a plurality of apertures formed therein through which respective finger-like beams of the radiation can pass such that the beams traverse respective linear paths, in said plane of interest, through the body, said detector means including a respective detector device for each of said beams, each device comprising a scintillator, adapted to scintillate in response to the impact of said radiation, and having a planar output surface through which light can emerge, and a photomultiplier tube having a planar photo-sensitive target juxtaposed with, and substantially parallel to, said output surface; said tube being of larger dimensions, measured in a direction extending across the width of said swath, than said output surface; wherein adjacent scintillators are placed substantially in contact with one another and, in order to adapt the apparatus to accommodate the tubes of adjacent detector devices in said juxtaposed relationship with their respective scintillators, notwithstanding said larger dimensions of said tubes as compared with said scintillators, the output surface of adjacent scintillators are disposed in different planes.

3,944,834

POLLUTION MONITOR WITH SELF-CONTAINED CALIBRATION AND CELL-BLOCK THEREFOR

Raymond L. Chuan, Altadena; Parameswar Mahadevan, Cerritos, and Daryl J. Bergquist, Huntington Beach, all of Calif., assignors to Celesco Industries Inc., Costa Mesa, Calif.

Filed Oct. 4, 1974, Ser. No. 512,338
Int. Cl.[2] G01D *18/00*; G01J *1/42*; G01N *21/38*
U.S. Cl. 250—372 **20 Claims**



1. A pollution monitor for detecting the presence of a gaseous pollutant in a gas sample comprising:

A. A sample cell having:

1. a cell cavity,

2. means for flowing a gas sample through the cell cavity,

3. a first window for admitting ultraviolet energy into said cell cavity to cause fluorescence of the gaseous pollutant in said gas sample, and

4. a second window mounted at an angle with respect to said first window for permitting fluorescent energy to emerge from said cell cavity;

B. A calibration cell having:

1. a cell cavity,

2. a first window for admitting ultraviolet energy into said calibration cell cavity,

3. a second window mounted at an angle with respect to said first window of the calibration cell for permitting scattered energy to emerge from said calibration cell cavity, and

4. a non-gaseous, scattering material mounted in the cavity of said calibration cell to intercept ultraviolet radiation entering said calibration cell and scatter said ultraviolet energy into a spectral region which simulates the fluorescence of the gaseous pollutant, said material being positioned to project the scattered energy out of the second window of the calibration cell;

C. Means for projecting a beam of ultraviolet light toward said cells;

D. A detector positioned to detect fluorescent or scattered energy emerging from said cells;

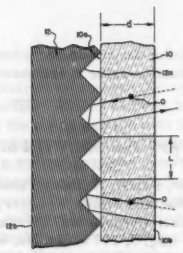
E. Said sample cell and said calibration cell being movably mounted with respect to said projecting means and said detector to permit selective movement of said cells into the light path between said source and detector.

3,944,835

HIGH ENERGY RADIATION DETECTOR HAVING IMPROVED REFLECTIVE BACKING FOR PHOSPHOR LAYER

Kirby G. Vosburgh, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 25, 1974, Ser. No. 509,281
Int. Cl.[2] G01J *1/58*
U.S. Cl. 250—487 **27 Claims**



1. An improved high energy radiation detector comprising a layer of material responsive to high energy radiation events originating external of the detector for converting the high energy radiation events absorbed in the layer of material to light photons, and

read-out means in communication with said layer of high energy radiation responsive material for producing signals in response to the light photons emitted by said layer,

the improvement consisting of

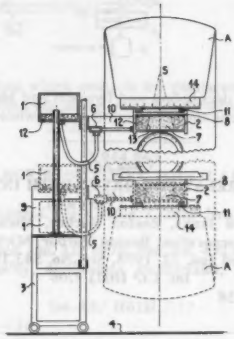
a member positioned adjacent said layer of high energy radiation responsive material along a first major surface thereof nearest the source of high energy radiation events, said member having a light-reflective first major surface positioned along the first major surface of said layer of high energy radiation responsive material and being defined by a plurality of closely spaced corner reflectors wherein each corner reflector consists of three sides forming substantially identical isosceles triangles having a common vertex and an open base forming an equilateral triangle, the length of one side of the base being less than the thickness of the layer of high energy radiation responsive material, the corner reflectors reflecting rearward traveling light photons in said layer wherein each reflected path is substantially parallel to the incident path of the rearward traveling light photon so that said reflective member provides a high quality reflective surface.

3,944,836

AUXILIARY COLLIMATING DEVICE FOR OBTAINING IRRADIATION FIELDS OF ANY SHAPE FOR HIGH ENERGY RADIOTHERAPY APPARATUS

Pierre Piret, Liege; Hubert Fraikin, Bassenge, and Armand Hubert, Liege, all of Belgium, assignors to C.G.R. -MeV, Paris, France

Filed Apr. 5, 1974, Ser. No. 458,445
Claims priority, application Belgium, Apr. 10, 1973, 798040
Int. Cl.² A61N 5/10; G21K 1/04
U.S. Cl. 250—505 4 Claims



1. An auxiliary collimating device for obtaining irradiation fields of any shape for irradiation apparatus provided with a source of highenergy particles and a main collimator, said auxiliary collimating device comprising a first container, termed a master container, and a second container, termed a localising container, said containers being integral with a chassis movable along guide rails; said containers being interconnected by a flexible pipe; said master container being, in a position of rest, filled with mercury ; said localising container containing a block of expanded polystyrene of predetermined shape; said block having lateral walls converging toward said source of particles; the block having cross-section the dimensions of which are homothetic to the dimensions of the field to be irradiated midway of the depth of the volume to be treated.

3,944,837

SYSTEM AND METHOD FOR GENERATION AND DISTRIBUTION OF ELECTRICAL AND THERMAL ENERGY AND AUTOMATIC CONTROL APPARATUS SUITABLE FOR USE THEREIN

William Foulks Meyers, Blue Bell, and Oleg Serge Savinov, Northwales, both of Pa., assignors to Savco, Inc., Ambler, Pa.

Filed Aug. 26, 1974, Ser. No. 500,251
Int. Cl.² H02P 9/04; F24D 3/02
U.S. Cl. 290—40 R 11 Claims

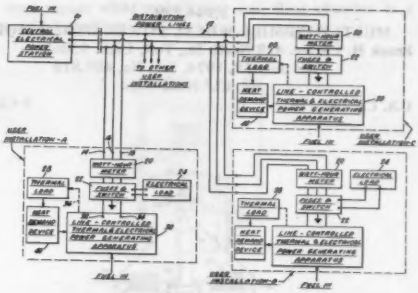
1. In a power generating and distributing system including central station means for generating electrical power, local user installations having electrical loads requiring electrical power and having useful time-varying thermal loads requiring thermal power, and distribution power lines for interconnecting said central station means and said electrical loads at said local user installations, the improvement comprising:

a plurality of distributed local power generating means, each at a different one of a plurality of said user installations, and each comprising local mechanically-operable electrical generating means and local heat engine means for operating said local generating means,

means for connecting the electrical outputs of said local electrical power generating means to said power lines,

heat exchange means for delivering thermal power generated by said local power generating means at each of said user installations to corresponding ones of said thermal loads and

means for controlling the operation of each of said local heat engine means to vary the quantity of said delivered thermal power in response to the quantity of thermal power required by the corresponding associated thermal load and so as to supply said required thermal power;



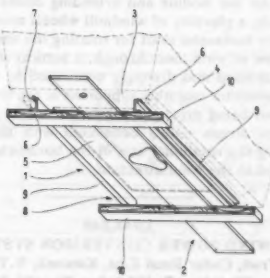
said means for controlling the operation of each of said local heat engine means comprising means for varying in the same sense the thermal power and electrical power generated by the corresponding one of said local power generating means, whereby increases in said generated thermal power are accompanied by increases in said generated electrical power while substantially all of said generated thermal and electrical power are usefully employed.

3,944,838

ARRANGEMENT FOR PROTECTING THE GONADS IN X-RAY DIAGNOSTICS

Ernst-August Gäde, Annastrasse 10, 625 Limburg, Lahn, Germany

Filed Sept. 6, 1974, Ser. No. 503,758
Claims priority, application Germany, Sept. 8, 1973, 7332714; Feb. 13, 1974, 2406717
Int. Cl.² G21F 3/00
U.S. Cl. 250—515 14 Claims



1. Arrangement for protecting the gonads in X-ray diagnostics for use in connection with diagnostic X-ray appliances provided with an anti-diffusing screen and equipped with a light visor to indicate the object field of the X-rays, with a shadow-casting means movably arranged in a mounting device attachable to the anti-diffusing screen, this shadow-casting means including a support made of a material permeable to light and X-rays, as well as a plate made of a substance impermeable to light and X-rays, characterized in that the mounting device includes a rectangular mounting frame having two longitudinal legs provided with sliding bars, to which two cross

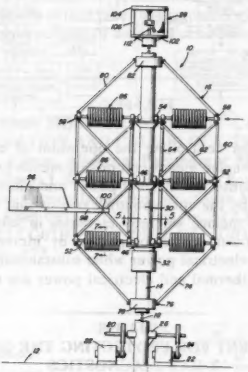
legs are attached which laterally project beyond the longitudinal legs and are provided each with a longitudinal slot; and that the shadow-casting means is fashioned as a plate narrow as compared to the longitudinal slots, which plate can be inserted and displaced in these longitudinal slots, the length of this plate exceeding that of the longitudinal legs by at least twice such length; and that the width of the plate is equal to or little smaller than that of the support.

3,944,839

MULTI-WINDMILL WHEEL POWER GENERATOR

Frank H. Carter, 428 North St., Taft, Calif. 93268

Filed July 18, 1974, Ser. No. 489,815
Int. Cl.² H02P 9/04
U.S. Cl. 290—55 **9 Claims**



1. A power generator comprising a supporting stationary column, a windmill wheel module rotatably supported from said column for swivelling movement about a substantially vertical axis, vertically spaced horizontal shafts rotatably journaled on the module and extending diametrically of the vertical axis, a plurality of windmill wheels mounted on each end of each horizontal shaft for rotating the shaft in response to axial flow of wind therethrough, a vertical shaft supported from the column and drivingly connected to the horizontal shafts, a generator assembly supported at the lower end of the column and being drivingly connected to the vertical shaft, and rudder means rigidly connected with the module for maintaining the rotational axis of the horizontal shaft generally parallel to the wind direction.

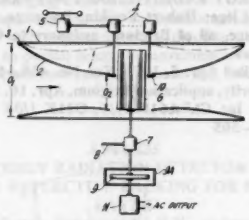
3,944,840

WIND POWER CONVERSION SYSTEM

John H. Troll, Cedar Road East, Katonah, N.Y. 10536

Filed Aug. 7, 1974, Ser. No. 495,268
Int. Cl.² F03D 9/00
U.S. Cl. 290—55 **2 Claims**

1. A wind to electric system comprising:
a. a wind collecting structure having an entrance and exit opening;
b. means for varying the areas of said entrance and exit openings relative to one another;
c. means for sensing the velocity of an incoming wind;
d. means coupled to said sensing means for adjusting the ratio between the areas of the entrance and exit openings in accordance with the sensed velocity;
e. a wind-driven blade set disposed at the exit opening to receive the wind therefrom;
f. flywheel coupled to the wind-driven blade set;



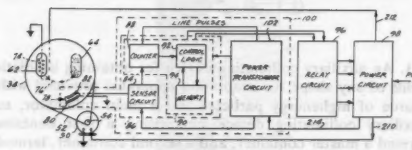
g. clutch for decoupling said flywheel and blade set;
h. an A.C. generator coupled to said flywheel.

3,944,841

TWO COIL RELAY FOR DRYER WITH INTEGRATED CIRCUIT CONTROL

Donald Edward Janke, Benton Harbor, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 22, 1975, Ser. No. 543,189
Int. Cl.² H02J 4/00
U.S. Cl. 307—38 **29 Claims**



1. In a clothes drying machine having different modes of machine operation, means for selectively obtaining the operative mode desired, said means comprising:
a power circuit for connection to a power source,
power loads selectively energized by the power circuit for effecting operation of the machine, said power loads including a motor, heater means, and a master control circuit, said master control circuit having an integrated circuit with a first and a second output for emitting control signals, and
relay circuit means interfacing between the power circuit and the master control circuit and responsive only to the control signals from the first and the second integrated circuit outputs for controlling selective energization of the power loads to provide four distinct modes of machine operation.

3,944,842

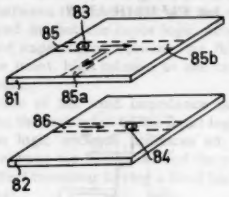
MAGNETIC DOMAIN LOGIC DEVICE

Jan Willem Frederik Dorleijn; Willem Frederik Druyvesteyn, and Frederik Ate de Jonge, all of Eindhoven, Netherlands

Continuation of Ser. No. 277,150, Aug. 2, 1972, abandoned. This application June 12, 1974, Ser. No. 478,575
Claims priority, application Netherlands, Aug. 3, 1971, 7110674
Int. Cl.² H03K 19/168; G11C 11/14
U.S. Cl. 307—88 LC **3 Claims**

1. A magnetic device comprising a first plate of a magnetic material in which at least one domain is present, a domain guiding structure having a plurality of continuous branched connecting paths for the displacement of the domain in the first plate, a second plate of magnetic material in which a domain is present, said second plate covering, at least in projection, at least a part of the first plate, an interaction force occurring between at least one domain in the first and one

domain in the second plate, and a domain guiding structure having at least one path for the displacement of a domain in



the second plate which controls the displacement of the domain in the first plate along one of said paths therein.

3,944,843

IMPEDANCE RESPONSIVE TOUCH ACTUATED CIRCUIT

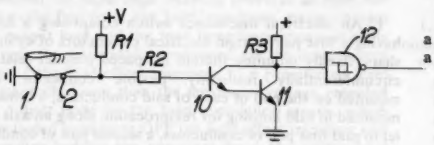
Filinto Vaz Martins, rue Coulon 2, 2000 Neuchatel, Switzerland

Filed Jan. 11, 1974, Ser. No. 432,603

Claims priority, application Switzerland, Mar. 9, 1973, 3472/73

Int. Cl.² H01H *3/12*

U.S. Cl. 307—116 **5 Claims**



1. A switching circuit responsive to the impedance of a human hand comprising:

a transistor having a pair of principal conduction electrodes and a control electrode receptive in use to a current for controlling the conductivity of the transistor;

means for applying a bias voltage in use to one of said principal conduction electrodes; and

a voltage divider circuit comprising a pair of resistors electrically connected in series, means electrically connecting one of said resistors to said control electrode, a first conductive contact electrically connected to the junction of said pair of resistors, and a second conductive contact electrically connected to the other of said principal conduction electrodes and bridgeable with a portion of a human hand to introduce the impedance of the portion of the human hand between the junction of said pair of resistors and the other of said principal conduction electrodes and thereby vary the current to said control electrode in use to vary the conductivity of said transistor.

3,944,844

FLOAT OPERATED ELECTRICAL SWITCH ASSEMBLY

Robert Innes, Beaconsfield, England, assignor to Ronald Trist Controls Limited, England

Continuation of Ser. No. 365,627, May 31, 1973, abandoned.

This application July 30, 1974, Ser. No. 493,089

Claims priority, application United Kingdom, June 12, 1972, 27299/72

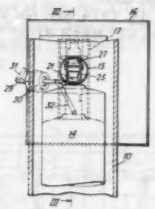
Int. Cl.² G01F *3/06*

U.S. Cl. 307—116 **4 Claims**

1. In a float-operated electrical switch assembly for indicating the liquid level in a liquid containing system having a sidewall, said switch assembly comprising a tubular float housing, a float restrained to move in said float housing with changes in the level of a liquid therein, and a magnet mounted on said float, the improvement which comprises

a tubular casing of non-magnetic material extending into said float housing transversely of said float housing, and having a portion projecting transversely outwardly from said float housing, the interior of said tubular casing being sealed from the interior of said float housing,

duct means attached to said float housing and adapted to be fastened to said sidewall and to permit liquid to flow between said system and said float housing through said duct means while maintaining said float chamber in a vertical position,



a switch unit housing containing an electrical switch unit, and connected to said projecting portion of said non-magnetic casing externally of said float housing, said switch unit housing having an opening in the side thereof remote from said non-magnetic casing,

a removable cover for said opening, and

a magnetically responsive switch actuator extending from said switch unit into a region within both said non-magnetic casing and said float housing for actuation by said magnet, said actuator and electrical switch unit being dimensioned to be removable through said opening when said cover is removed.

3,944,845

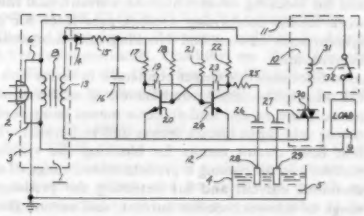
LIQUID LEVEL SHUTOFF CONTROL

Frank Kenneth Luteran, 10 Charles St., Auburn, N.Y. 13021

Filed Sept. 9, 1974, Ser. No. 504,310

Int. Cl.² H01H *35/18*

U.S. Cl. 307—118 **9 Claims**



1. A system for energizing a load from a power line when the level of a conductive liquid is above a preset point comprising:

a. electrical energy means producing a D.C. voltage and an A.C. voltage from the power line,

b. signal generating means connected to the electrical energy means and in response to the D.C. voltage applied thereto producing a high frequency signal,

c. an input conductive probe contacting the liquid and coupled to the signal generating means,

d. an output conductive probe contacting the liquid and providing a conductive path for the high frequency signal

from the input conductive probe through the liquid to the output conductive probe,

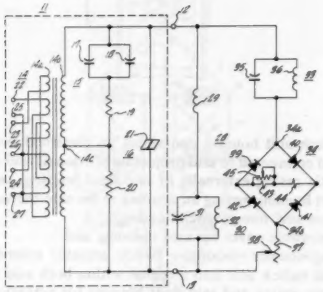
e. switching means coupled to the electrical energy means and to the output conductive probe for connecting the load across the A.C. voltage whenever conduction of the high frequency signal occurs from the input conductive probe to the output conductive probe.

3,944,846

SUBSYNCHRONOUS RELAY

Maxwell A. Thompson, Alhambra, and Tak S. Ning, Los Angeles, both of Calif., assignors to Southern California Edison Company, Rosemead, Calif.

Filed Mar. 19, 1974, Ser. No. 452,662
Int. Cl.² H01H *83/00*
U.S. Cl. 307—129 **10 Claims**



1. A subsynchronous overcurrent relay system for providing protection for sustained subsynchronous current in a power system having a normal synchronous operating frequency and wherein said subsynchronous current is of a lower frequency,

input circuit means for connection with said power system for receiving from said power system a subsynchronous current,

first filter means connected across said input circuit means for passing synchronous current at said normal frequency and for blocking subsynchronous current, said filter network means comprising a block-pass filter for passing synchronous current and blocking said subsynchronous current, and

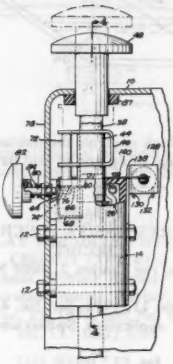
second filter network means connected in series with detector means, the series combination of said second filter network means and said detector means being connected across said input circuit means and in parallel with said first filter circuit means for blocking the synchronous current and for passing a predetermined range of subsynchronous current and for detecting the predetermined range of subsynchronous current, said second filter network means comprising a filter network for passing said predetermined range of subsynchronous current and for blocking said synchronous current, and said detector means comprising a first high-set detector and a second low-set detector both connected in series and connected in series with said second filter network means for respectively operating when said subsynchronous current is within said predetermined range, said detectors having upper and lower response limits for the subsynchronous current for providing, after predetermined delays to allow for natural damping of the subsynchronous current, a change of state of an associated electrical contact means when the subsynchronous current is greater than the limits.

3,944,847

ELECTRICAL DISCONNECT SWITCH

Joseph D. Kinnear, 5631 S. Sixth Ave., Countryside, Ill. 60525

Filed Dec. 7, 1973, Ser. No. 422,665
Int. Cl.² H01H *13/68*
U.S. Cl. 307—131 **21 Claims**



1. An electrical disconnect switch comprising a housing having a first pair of rigid electrical conductors of cylindrical shape fixedly mounted therein in spaced parallel relation, a circumferentially resiliently flexible connector sleeve mounted on the end of each of said conductors, a cross head mounted in said housing for reciprocation along an axis parallel to said first pair of conductors, a second pair of conductors of cylindrical shape fixedly mounted on said cross head in spaced parallel relation for interengagement with said connector sleeves when the cross head is moved toward said first pair of conductors, said second pair of conductors being connected in series so that when the second pair of conductors engage with said connector sleeves a series circuit is established between the first pair of conductors through the second pair of conductors, manually operable means for moving said cross head toward said first pair of conductors to interengage the second pair of conductors with said connector sleeves, means biasing said cross head in a direction away from said connector sleeves to disengage the second pair of conductors therefrom, and manually releasable latch means for retaining the cross head in a position wherein the second pair of conductors engage with said connector sleeves and adapted when released to shift the cross head with a snap action to a position wherein the second pair of conductor disengage from the connector sleeves.

3,944,848

VOLTAGE SENSITIVE ISOLATION FOR STATIC LOGIC CIRCUIT

Richard H. Heeren, Palatine, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Dec. 23, 1974, Ser. No. 535,266
Int. Cl.² H03K *19/08, 19/36, 19/34, 17/04*
U.S. Cl. 307—205 **10 Claims**

9. A logic circuit of a type having an input logic network responsive to a set of input signals for producing at a first point either an essentially short circuit to a reference point of reference potential or an open circuit to the reference point depending upon the set of input signals;

an output node;

an output load connected between the output node and the reference point;

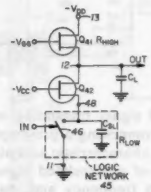
load impedance means having at least two electrodes, said electrodes being connected between a voltage supply and the output node; and

a field-effect transistor having its drain-source path connected between the first point and the output node

characterized in that the input logic network exhibits an associated capacitance between the first point and the reference point, high relative to the capacitance of the output node;

the resistance of the load impedance means being high relative to the resistance of the input logic network when the input logic network produces an essentially short circuit between the first point and the reference point;

the field-effect transistor having a fixed bias voltage applied to its gate;



the fixed bias voltage being selected so that when the input logic network produces a short circuit to the first point the reference potential is applied to the output node and whenever the input logic network provides an open circuit to the first point, the load impedance means charges the output load and the load impedance means initially charges the associated capacitance via the drain-source path of the field-effect transistor to a preselected level substantially lower than the maximum voltage provided the output node by the load impedance means, which preselected level turns OFF the field-effect transistor and thereafter isolates the capacitor from the output load until the charge on the associated capacitance goes below the preselected level.

3,944,849

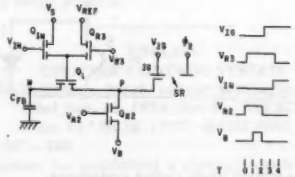
CHARGE TRANSFER DEVICE SIGNAL PROCESSING

Al Felix Tasch, Jr., and John Millard Caywood, both of Richardson, Tex., assignors to Texas Instruments Inc., Dallas, Tex.

Filed June 26, 1974, Ser. No. 483,328

Int. Cl.² H01L *27/10*; **G08C** *15/08*; **H01L** *31/00*

U.S. Cl. 307—221 D **20 Claims**



1. Charge transfer device signal processing apparatus including a charge transfer device shift register having at least one input for receiving analog input signals; first semiconductor switch means for connecting said input to a first reference potential during a first clock period; second semiconductor switch means including a first transistor switch means for resetting said input to a second predetermined reference potential during a second clock pulse period; and third semiconductor switch means operable to connect said input to said charge transfer device shift register during a third clock pulse period for applying an analog input related signal thereto for serial propagation along said shift register said second and third semiconductor switch means each including a common switching transistor means for controlling the resetting of said input to said second predetermined reference potential and for controlling transfer of said input signal from said input into said shift register.

3,944,850

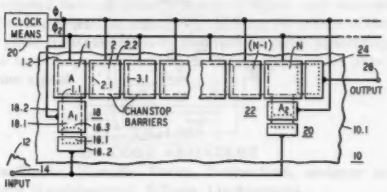
CHARGE TRANSFER DELAY LINE FILTERS

Robert Henry Walden, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 470,511, May 16, 1974, abandoned. This application July 31, 1975, Ser. No. 600,272

Int. Cl.² H03H *11/00*; **H01L** *27/10*, *29/78*

U.S. Cl. 307—221 D **7 Claims**



1. A charge transfer device for filtering an analog signal comprising,

means including a charge storage medium for forming a delay line including a plurality of charge storage cells formed in said medium, said cells being connected in series with one another and each being of area A, a pair of terminal cells one of which forms the input and the other of which forms the output of said delay line,

means forming in said medium charge storage control cells of areas A_1 and A_2, where A_1 is different from A_2, and

means for applying said signal to one terminal cell through one of said charge storage control cells and for applying a delayed version of said signal through the other charge storage control cell to said one terminal cell.

3,944,851

RING COUNTER CIRCUIT WITH ELECTRONIC SWITCH CONTROL OF CLOCK PULSE TRANSMISSION

Willy Minner, Schwaigern, Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed May 29, 1974, Ser. No. 474,445

Claims priority, application Germany, June 1, 1973, 2327952

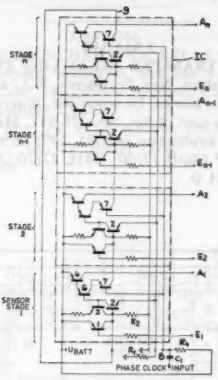
Int. Cl.² H03K *21/00*, *23/08*, *27/00*

U.S. Cl. 307—223 R **2 Claims**

1. In a ring counter composed of a plurality of stages each including a holding circuit and an electronic switch, said stages being connected to one another in succession to form sequence switches to switch voltages on and off in electronic equipment, with each stage being switchable between a first and a second state and with one stage being in the first state and the remaining stages being in the second state at any given moment, and means connected for supplying to the stages a succession of clock pulses in such a manner that each clock pulse switches the one stage from the first state to the second state and switches the immediately succeeding stage from the second state to the first state, the improvement wherein said means comprise;

in each said stage, a first transistor connected in said stage to be in a switching state determined by the state of its respective stage and a second transistor connected between said first transistor and the next-succeeding stage

and having a control input connected to receive the clock pulses, said second transistor being connected to supply, upon the occurrence of a clock pulse, a signal which switches the next-succeeding stage to its first state only when said first transistor is in its switching state corresponding to the first state of said stage, whereby each clock pulse acts on the input of only the stage succeeding that stage which was in its first state prior to such pulse to place such next-succeeding stage in its first state, and further acts to swtich the stage which was previously in its first state into its second state.



3,944,852

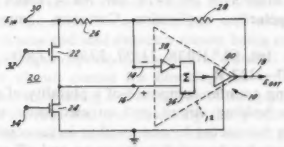
ELECTRICAL SWITCHING DEVICE AND MODULATOR USING SAME

Roswell W. Gilbert, New York, N.Y., assignor to Motor Finance Corporation, Dunellen, N.J.

Division of Ser. No. 210,456, Dec. 21, 1971, Pat. No. 3,746,851, and a continuation-in-part of Ser. No. 6,075, Jan. 27, 1970, Pat. No. 3,626,292, and a continuation-in-part of Ser. No. 184,026, Sept. 27, 1971, Pat. No. 3,745,557, which is a division of Ser. No. 6,075, Jan. 27, 1970. This application Apr. 16, 1973, Ser. No. 351,502

Int. Cl.² G06G 7/12; H03K 17/60

U.S. Cl. 307—229 9 Claims



1. An electrical switching device, said device including a high-gain differential amplifier having first and second input terminals, an impedance continuously connected at one end to the first of said input terminals, said impedance being connected at the other end to a third terminal for receiving an input signal, and switching means for connecting the second of said input terminals alternately between said third terminal and a fourth terminal for receiving a signal of a magnitude lower than the input signal to said thrid terminal, said switching means including a pair of field effect transistors, one connected between said second and third terminals, and the other connected between said second and fourth terminals.

3,944,853

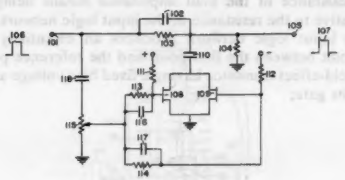
VIDEO RECORDER PRE-EMPHASIS, DE-EMPHASIS CIRCUITS

Eugene A. Cooper, Placentia, Calif., assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 12, 1974, Ser. No. 496,849

Int. Cl.² H03K 5/08; H04B 1/10, 1/62; H04N 5/78

U.S. Cl. 307—237 4 Claims



1. In a wide band signal translating arrangement a pre-emphasizing circuit comprising a pre-emphasis network with a frequency response characteristic accentuating the high-frequency components of a translated signal as a continuous direct function of its frequency and, coupled to said pre-emphasis network, a frequency-discriminating network having an amplitude response characteristic non-linearly accentuating attenuation of high-frequency signals of high amplitude,

said frequency discriminating network including the series combination of a capacitor and the source-electrode/drain-electrode path of at least one field effect transistor, said combination being connected in shunt relation to the output side of said circuit and the gate-electrode of said field effect transistor being connected to the input side of said circuit.

3,944,854

LIGHT-EMITTING DIODE CONNECTED TO A COIL

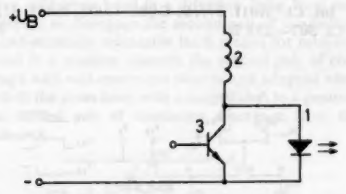
Hans Keller, Gundelfingen, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Dec. 5, 1974, Ser. No. 529,771

Claims priority, application Germany, Dec. 22, 1973, 2364301

Int. Cl.² H01L 33/00

U.S. Cl. 307—311 9 Claims



1. A light-emitting diode circuit comprising:

means for applying a supply voltage having first and second poles;

a coil having first and second terminals, said first terminal coupled to said first pole;

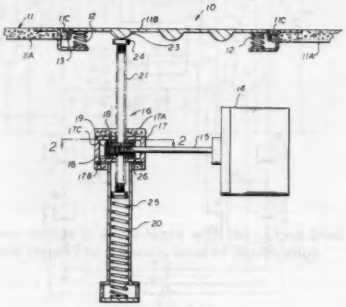
a first transistor operated as a switch having a base, emitter and collector, said emitter coupled to said second pole and said collector coupled to said second terminal; and

at least one light-emitting diode coupled in parallel across the collector-emitter path of said first transistor, said diode having a forward threshold voltage higher than said supply voltage.

3,944,855
METHOD AND APPARATUS FOR GENERATING ELECTRICITY BY VEHICLE AND PEDESTRIAN WEIGHT FORCE

Wayne P. Le Van, New York, N.Y., assignor to Van Allyn, Inc., New York, N.Y.

Filed Dec. 12, 1974, Ser. No. 532,046
Int. Cl.² H02K 7/06
U.S. Cl. 310—69 2 Claims



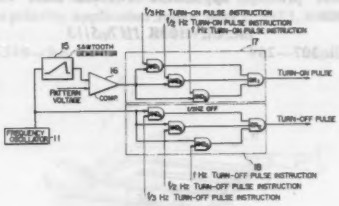
1. An apparatus for generating electrical energy comprising:
a traffic way over which traffic is permitted to flow,
said traffic way having a relatively fixed portion and a moveable portion,
means for resiliently supporting said moveable portion for movement relative to said fixed portion,
an electrical generator having a drive shaft,
and transmission means interposed between said drive shaft and said moveable portion of said roadway whereby the movement of said moveable portion is translated to said drive shaft to effect the rotation thereof,
said transmission means including a driving gear,
a screw,
a one way clutch connecting said screw in driving relationship with said driving gear,
a driven means disposed in driving relationship with said driving gear,
said driven means being connected to said drive shaft,
said screw being operatively disposed relative to said moveable portion of said traffic way whereby the displacement of said moveable portion effects the displacement of said screw to effect the drive of said driving gear,
and means acting on said screw to return said screw to its inoperative position as said moveable portion is restored to its initial position.

3,944,856
CHOPPER CONTROL SYSTEM

Taturo Horie, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 11, 1974, Ser. No. 522,922
Int. Cl.² H03K 17/72; H02M 7/48
U.S. Cl. 307—240 5 Claims

1. A system for controlling a chopper which conducts in response to the application of a train of turn-on pulses and is rendered non-conducting in response to the application of a train of turn-off pulses, comprising a frequency oscillator for generating a train of pulses determining the maximum chopping frequency of said chopper and providing said turn-off pulses, means for generating said turn-on pulses in synchronism with said turn-off pulses generated by said frequency oscillator in such a relationship that said turn-on pulses alternate with said turn-off pulses, means for generating instruction signals consisting of a plurality of turn-on pulse instruction signals indicating the frequency of the turn-on pulse to be applied to the chopper and a plurality of turn-off pulse instruction signals indicating the frequency of the turn-off pulse to be applied to the chopper, turn-off pulse selecting means for selectively applying the pulses of the turn-off pulse train generated by said frequency oscillator to said chopper depending

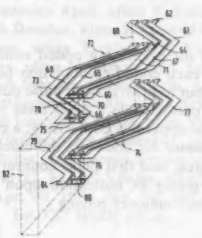


on the applied turn-off pulse instruction signal, and turn-on pulse selecting means for selectively applying the pulses of the turn-on pulse train generated by said turn-on pulse generating means to said chopper depending on the applied turn-on pulse instruction signal.

3,944,857
AIR-CORE ARMATURE

Fritz Faulhaber, Vernate, Tessin, Switzerland, assignor to Retobina Handelsanstalt, Schaan, Liechtenstein

Filed Sept. 19, 1974, Ser. No. 507,623
Claims priority, application Germany, Feb. 28, 1974, 2409681
Int. Cl.² H02K 1/22
U.S. Cl. 310—266 8 Claims

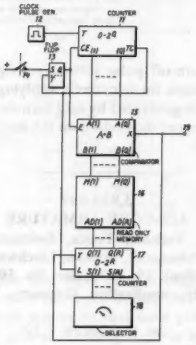


1. An air-core armature for electrodynamic machines, comprising, in combination, an elongated insulating strip rolled up to form a spiral structure composed of a plurality of radially successive layers; and an armature winding comprised of at least one armature coil, said armature coil being comprised of a plurality of electrically interconnected component coils, each of said component coils being formed of electrically interconnected conductor sections printed on both sides of said strip, said component coils being located on different respective ones of said radially successive layers but occupying substantially the same circumferential sector of said spiral structure and accordingly being substantially juxtaposed in direction radially of said spiral structure, wherein each of said component coils has one end and an other end, and is comprised at said other end of a circumferentially extending electrically conductive portion extending in the circumferential direction opposite to the direction from said one end to said other end, said circumferentially extending electrically conductive portions being so disposed as to compensate for the difference in circumferential length of different ones of said radially successive layers.

3,944,858
ARRANGEMENT FOR GENERATING PULSE SEQUENCES

Georg Gustaf Lennart Pettersson, Jarfalla, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Nov. 11, 1974, Ser. No. 522,623
Claims priority, application Sweden, Nov. 22, 1973, 7315809
Int. Cl.² H03K 1/17, 5/13
U.S. Cl. 307—269 2 Claims



1. Apparatus for generating coded combinations of code pulses wherein each coded combination has P possible code pulse positions but only M(i) code pulse positions being occupied by coded pulses while P-M(i) code pulse positions are unoccupied; said apparatus comprising: a clock pulse source; a first pulse counter for counting the clock pulses from said clock pulse source, said first pulse counter including indicating means for giving an indication upon counting P clock pulses; a read-only-memory having

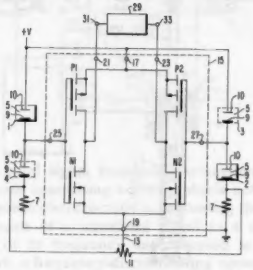
$$\sum_{i=1}^{N} M(i)$$

addressable cells subdivided into N sets of cells having consecutive addresses, wherein each set of cells is assigned to one of the coded combinations of code pulses and each cell of the set stores a number related to the position in the coded combination occupied by one of the M(i) pulses; a second pulse counter for counting identity pulses, said second pulse counter including output means for transmitting cell addresses to said read-only-memory in accordance with the instantaneous pulse counts accumulated therein; presetting means for selectively presetting said second pulse counter to store different initial counts; comparator means for comparing a first instantaneous count accumulated in said first pulse counter with the number stored in the addressed cell of said read-only-memory as represented by a second instantaneous count accumulated in said second pulse counter, said comparator means including means for transmitting an identity pulse to said second pulse counter each time a predetermined relationship exists between said first instantaneous count and said number; and a code pulse output means for emitting a code pulse each time an identity pulse is transmitted by said comparator means.

3,944,859
BRIDGE-BALANCE DETECTION CIRCUIT

Merle Vincent Hoover, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 3, 1974, Ser. No. 502,670
Int. Cl.² H03K 17/00
U.S. Cl. 307—308 9 Claims



1. The combination of:

a first bridge circuit having two output terminals, each at a different node of the bridge, and

a second bridge circuit for sensing the condition of the first bridge circuit, said second bridge circuit including four arms and four transistors, each transistor having a conduction path and a control electrode for controlling the conductance of said conduction path, each conduction path forming a different arm of said second bridge circuit, said second bridge circuit having two input terminals at two opposite nodes of the bridge, one such terminal at the control electrodes of two transistors in one pair of adjacent arms of the bridge and the other terminal at the control electrodes of the two transistors in the other pair of adjacent arms of the bridge, one input terminal connected to one output terminal of said first bridge circuit and the other to the other output terminal of said first bridge, said second bridge circuit having also a pair of output terminals, one at the connection of the conduction paths of said one pair of adjacent arms and the other at the connection of the conduction paths of said other pair of adjacent arms.

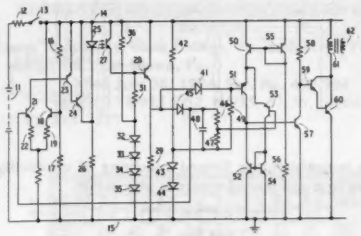
3,944,860
RADIATION-SENSITIVE SWITCHING CIRCUITS

John Howard Moore, Redditch, and Charles Peter Cockshott, Coventry, both of England, assignors to The Lucas Electrical Company Limited, Birmingham, England

Filed July 3, 1974, Ser. No. 485,436
Claims priority, application United Kingdom, July 12, 1973, 33334/73; Sept. 25, 1973, 44772/73
Int. Cl.² H03K 19/14, 3/42
U.S. Cl. 307—311 4 Claims

1. A radiation-sensitive switching circuit comprising in combination a radiation source having a current input means for establishing a current flow through the source, a radiation-sensitive device which conducts when exposed to the radiation source, a control member positioned between the source and the device and serving to expose the device to the source at predetermined instants of time, a trigger circuit coupled to the device and producing an output when the output from the device attains a set level, and a transistor means connected in parallel with said radiation-sensitive device for modifying the

current flow through the source, and sensing means connected to sense the output of the device and connected to control said



transistor means in accordance with the output from the device with respect to a known level of illumination.

3,944,861

RADIATION-SENSITIVE SWITCHING CIRCUITS

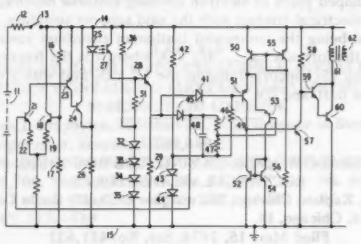
John Howard Moore, Redditch, and Charles Peter Cockshott, Coventry, both of England, assignors to The Lucas Electrical Company Limited, Birmingham, England

Filed July 3, 1974, Ser. No. 485,437

Claims priority, application United Kingdom, July 12, 1973, 33333/73; Sept. 25, 1973, 44771/73

Int. Cl.² H03K *3/42, 19/14*

U.S. Cl. 307—311 **5 Claims**



1. A radiation-sensitive switching circuit comprising in combination a radiation source, a radiation-sensitive device which conducts when exposed to the radiation source, a control member positioned between the source and device and serving to expose the device to the source at predetermined instants of time, a capacitive storage means, an emitter follower amplifier, circuit means connecting the device with the amplifier and capacitive storage means, said capacitive storage means being connected in the emitter circuit of said amplifier and thereby measuring the peak output of the device, potential dividing means connected to said storage means to develop a signal proportional to said peak output, and a trigger circuit having a comparator means coupled to said potential dividing means and to said device, said comparator means being responsive to establish a trigger output signal in response to the output from the device being a preselected proportion of said peak output.

3,944,862

X-CUT QUARTZ RESONATOR USING NON OVERLAPING ELECTRODES

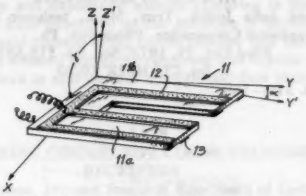
Akio Shimoi, Suwa; Kikuo Oguchi, Yashirohigashi, and Toshiaki Ogata, Suwa, all of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed May 2, 1974, Ser. No. 466,587

Claims priority, application Japan, May 2, 1973, 48-49359

Int. Cl. H01I *41/08*

U.S. Cl. 310—9.8 **10 Claims**



1. A flexural-mode quartz crystal vibrator comprising an elongated X-cut quartz crystal plate having at least one elongated vibratory portion including first and second opposed substantially planar surfaces and first elongated electrodes disposed on said first surface and adapted to be referenced to a potential having a first polarity and a further elongated electrode adapted to be referenced to a potential having a polarity opposite to said first electrodes and disposed on said second surface so that at least the portion of the respective electrodes on said vibratory portion are positioned on the respective surfaces out of overlapping relation.

3,944,863

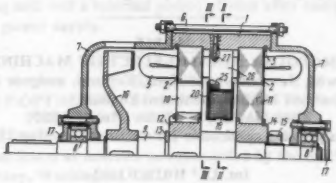
INDUCTOR MACHINE

Voldemar Voldemarovich Apsit, ulitsa V. Latsisa, 2a, kv. 21; Lev Eduardovich Dombur, ulitsa Raunas 45/5, kv. 212; Yan Yanovich Lutsavs, ulitsa Tseplya, 16; Vladislav Alexandrovich Pugachev, ulitsa Maskavas, 266, korpus 5, kv. 73; Mikhail Ivanovich Schukin, ulitsa Ierikju, 43, kv. 41, all of Riga; Sauljus Antanovich Dirzhis, ulitsa Arkhitektu 45, kv. 74, Vilnjus; Iozas Ionovich Karosas, ulitsa Smelju, 5, kv. 23, Vilnjus; Algis Vladislavovich Pashtukas, ulitsa Zhirmunu, 112, kv. 21, Vilnjus, and Leonid Borisovich Khlavnovich, ulitsa Gereses Vilt 22, kv. 13, Vilnjus, all of U.S.S.R.

Filed Apr. 30, 1974, Ser. No. 465,627

Int. Cl.² H02K *19/26*

U.S. Cl. 310—168 **2 Claims**



1. An inductor machine comprising, a frame, at least two stator packs attached to said frame and carrying a common armature winding, a toothed rotor having a number of packs corresponding to that of the stator packs, a field winding in the form of stationary annular coils disposed under said armature winding between said rotor packs, at least one mounting flange fixed to the frame and adjoining side faces of said annular coils, fastening means fixing the mounting flange to said frame and including individual prism-shaped keys arranged equidistantly on said frame at the inner surface thereof, said prism-shaped keys having axial holes for the

fastening of said flange thereto, said flange being in the form of a disc having a central opening and an annular portion around the central opening receiving said field winding, said disc having a plurality of holes along the periphery thereof for receiving fastening means engaging said holes in said keys, said flange have grooves in the spaces between said holes in said disc for the axial flow of cooling air.

3,944,864

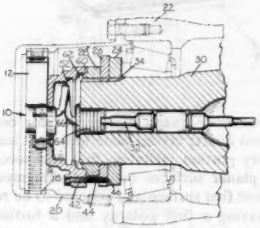
HUB CAP SPEED SENSOR

Raymond John Jovick, Troy, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Oct. 29, 1974, Ser. No. 518,653

Int. Cl.² H02K *19/20*

U.S. Cl. 310—168 **7 Claims**



1. An improved wheel speed sensor mounting system for mounting said sensor at the end of a spindle of an axle, said spindle including an interior passageway through which wiring from said sensor extends and means for retaining a wheel mounted thereon which includes a wheel bearing adjustment nut, a keyed lock ring, and a jam nut adapted to be respectively received on a threaded portion of said end of said spindle outwardly of said wheel, said sensor having therein an electromagnetic sensing means for generating a signal indicative of wheel speed when aligned with a rotor means for relative rotational movement therebetween, said rotor means being fixedly mounted to a hubcap to be coaxially aligned with said end of said spindle when said hubcap is secured to said wheel, wherein said improvement comprises:

means for securing said sensor to said keyed lock ring, and

said sensor having an interior cylindrical surface portion adapted to make contact with said end of said spindle for coaxial alignment with respect to said rotor means, said contact with said end being at a region thereof which is remote from said interior passageway.

3,944,865

HOMOPOLAR DYNAMO-ELECTRIC MACHINES

Cyril Jewitt, Newcastle-upon-Tyne, England, assignor to Reyrolle Parsons Limited, Hebburn, England

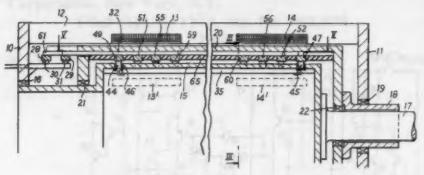
Filed May 23, 1974, Ser. No. 473,057

Claims priority, application United Kingdom, May 25, 1973, 25221/73

Int. Cl.² H02K *31/00*

U.S. Cl. 310—178 **8 Claims**

1. A homopolar dynamo-electric machine comprising a stationary field winding, first and second rotors mounted for rotation about a common axis in opposite directions relative to said field winding, each of said rotors comprising a plurality of conducting paths arranged to cut the field of the said winding upon rotation of the rotor, and current transfer means arranged to connect one end of the conducting path of the first rotor to the corresponding end of the the conducting path of the second rotor for the flow of current through the conducting paths of said first and second rotors between the ends thereof in opposite directions, said current transfer means comprising a plurality of current transfer devices each connecting one end of a conducting path on one rotor to the corresponding end of a conducting path on the other rotor



whereby a series circuit is formed consisting of conducting paths of the first and second rotors in alternation.

3,944,866

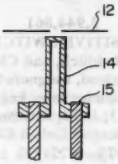
THERMIONIC EMITTER OF LANTHANUM STRONTIUM VANADATES

Michael Sayer, Kingston, Canada, assignor to Canadian Patents & Development Ltd., Ottawa, Canada

Filed Apr. 8, 1974, Ser. No. 458,849

Int. Cl.² H01J *1/14, 19/06*; H01B *1/06*

U.S. Cl. 313—346 R **1 Claim**



1. A thermionic emitter for electron beam apparatus comprising a metallic, electrically conducting support structure and a shaped piece of electron emitting material mounted on and in electrical contact with the said support structure, said material being the compound lanthanun strontium vanadate having the formula $La_{(1-x)}Sr_xVO_3$ where x is the fraction of strontium (Sr) incorporated in the La VO_3 and with x lying between 0.01 and 0.4.

3,944,867

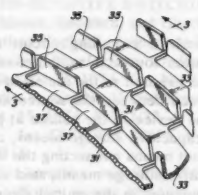
SHADOW MASK HAVING RIBS BOUNDING RECTANGULAR APERTURES

Sam H. Kaplan, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Mar. 15, 1974, Ser. No. 451,622

Int. Cl.² H01J *29/06, 29/07*

U.S. Cl. 313—403 **2 Claims**



1. A shadow mask for use in a color cathode ray tube comprising a relatively thin, spherically curved sheet of electrically conductive material which defines a spherical mask plane and which has therein a periodic array of elongated, rectangularly shaped electron transmissive apertures, said periodic array forming a plurality of columns, each of said apertures being bounded on one of the longer sides thereof by a rib out-struck

from the sheet and extending from the convex side thereof for imparting rigidity to the mask and for defining, at least in part, the electron transmissive aperture.

3,944,868

SEGMENTED GAS DISCHARGE DISPLAY PANEL DEVICE

George A. Kupsky, State College, Pa., assignor to Panel Technology, Inc., Lewistown, Pa.

Filed July 30, 1974, Ser. No. 492,994
Int. Cl.² H01J 5/52, 61/35, 61/36, 61/66
U.S. Cl. 313—517 4 Claims

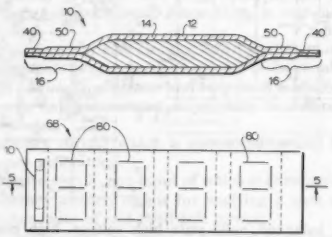
3. In an electrical display device comprising an envelope defined by a pair of flat, insulating plates which are parallel and spaced from each other, a plurality of silver electrodes seated on one of the plates and having a plurality of associated silver contact pads terminating along an overhung edge of the first plate, at least one transparent tin oxide electrode seated on the other of the plates and having a conductive tin oxide lead terminating along an edge of said other plate, the terminals and the lead to the first and second electrodes being on opposed surfaces of the respective plates, and means for sealing a display-supporting medium in the envelope between the plates along a predetermined perimeter, the improvement comprising a conductive, bubble-free extrusion inserted between said plates and between selected ones of said conductive tin oxide leads and contact pads in said opposite plate so that the contact pads on said overhung edge supply electrical energy to all said electrodes.

3,944,869

DISPLAY PANEL WITH EXPANSIBLE, METALLIC CAPSULE CONTAINING MERCURY AND METHOD OF MAKING SAID CAPSULE

George J. Przybylek, Martinsville, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 355,178, April 27, 1973, Pat. No. 3,895,709. This application Jan. 10, 1975, Ser. No. 540,050
Int. Cl.² B23P 17/00; H01J 61/28, 61/66
U.S. Cl. 313—519 3 Claims



2. A heat sealed display panel comprising:

an envelope including a flat base plate having a generally flat outer surface and an inner surface carrying a plurality of groups of cathode glow electrodes and means for making external connection thereto;

an anode electrode in said envelope for each of said groups of cathode electrodes;

a face plate having a viewing window and forming a gas-filled enclosure within said base plate;

said face plate being heat-sealed to said base plate along adjacent edge portions thereof to hermetically seal said envelope; and

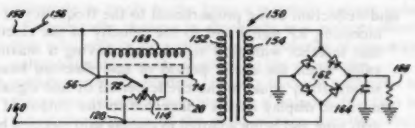
a metallic mercury-containing capsule disposed within said envelope and expansible without rupturing in the presence of heat generated as the envelope is hermetically sealed, said capsule being visible through said face plate whereby focused energy for rupturing said capsule can be transmitted to said capsule through said face plate.

3,944,870

DEGAUSSING CIRCUIT FOR COLOR TELEVISION RECEIVERS

Walter T. Sutton, Jr., and James B. Sims, both of Lexington, Ky., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 689,923, Dec. 8, 1967, abandoned. This application Feb. 11, 1971, Ser. No. 114,689
Int. Cl.² H01J 29/07; H01F 13/00
U.S. Cl. 315—8 7 Claims



1. In combination with a color television receiver having picture-tube means embodying magnetically permeable material which tends to become undesirably magnetized, a power supply for said picture-tube means, and a switch actuable to connect said power supply to an alternating current source for energizing said power supply, a degaussing coil disposed in demagnetizing relation to said material, self-heating resistor means of positive temperature coefficient of resistivity connected in series with said coil to be energized with said power supply to permit current in said coil for initiating demagnetizing of said material and to heat said resistor means for progressively reducing current in said coil to demagnetize said material, and thermally responsive relay means actuable in response to increase in temperature of said resistor means for shunting said coil a selected period of time after energization of said power supply.

3,944,871

SELF-OPTIMIZING RF SIGNAL DETECTION AND PANORAMIC DISPLAY APPARATUS

Richard S. Trenam, Adelaide, Australia, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 14, 1970, Ser. No. 70,610
Int. Cl.² H01J 29/52
U.S. Cl. 315—30 1 Claim

1. Self-optimizing RF signal detection and display apparatus comprising:

a cathode ray tube having a drift tube;

a pair of elongated signal electrodes,

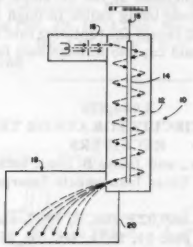
said electrodes being disposed in a spaced and parallel manner with respect to each other symmetrically within said drift tube and further being at a positive potential with respect to said drift tube;

input terminal means for coupling an incoming RF signal to said electrodes;

electron source means for producing an electron beam traveling within said drift tube and having a selectively predetermined range of electron velocities;

means for guiding said electron beam through said drift tube and between said signal electrodes in a substantially zig-zag manner,

whereby the electrons in said electron beam interact with said incoming RF signal to thereby produce a deflection of said electron beam,



said deflection being proportional to the frequency of said incoming RF signal and to the velocity of the electrons that interact with said signal, and, having a maximum value when the cyclic period of said electron beam is substantially equal to the cyclic period of said signal,

panoramic display means connected to the output of said drift tube and being adapted to display said electron beam after it is deflected.

3,944,872

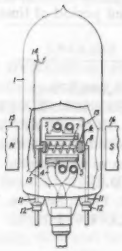
RADIO FREQUENCY NOISE GENERATING MAGNETRON

Donald A. Wilbur, Troy, and Philip H. Peters, Jr., Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 11, 1952, Ser. No. 303,726

Int. Cl.² H01J *25/50*

U.S. Cl. 315—39.51 **14 Claims**



1. A magnetron discharge device for noise generation comprising an elongated cathode and a plurality of anode segments surrounding said cathode to define a cylindrical space charge chamber, said cathode comprising a helix having a diameter equal to at least half the space charge chamber diameter and having a spacing between adjacent turns equal to at least half the helix diameter.

3,944,873

HOLLOW CATHODE TYPE ION SOURCE SYSTEM INCLUDING ANODE SCREEN ELECTRODES

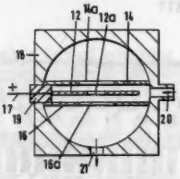
Joseph Franks, London, England, and Dennis John Baghurst, Newport, Wales, assignors to Ion Tech Limited, Middlesex, England

Filed Sept. 23, 1974, Ser. No. 508,793

Claims priority, application United Kingdom, Sept. 24, 1973, 44718/73

Int. Cl.² H01J *7/24*; H05B *7/06*; H05H *1/00*

U.S. Cl. 315—111.8 **17 Claims**



1. An ion source having an electrode system comprising:

a hollow cathode having an ion outlet in a wall thereof;

means for providing an ionizable gas in said cathode;

an anode mounted in an intermediate zone in the cathode and cooperable therewith for producing an electric field, said anode having an aperture therethrough aligned with said ion outlet;

means through the cathode wall for connecting the anode to a source of operating potential;

means for preventing perturbation of said field by said connecting means and comprising a pair of screen electrodes in said intermediate zone in said cathode and each having an aperture therethrough larger than and coaxial with the aperture in said anode, said pair of screen electrodes being symmetrically disposed in axially spaced sandwiching relation with respect to said anode.

3,944,874

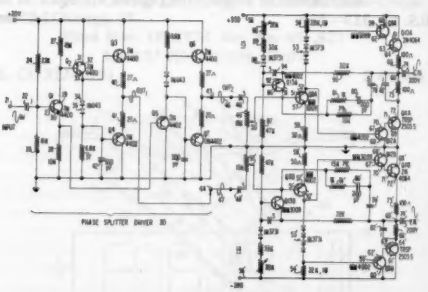
SOLID STATE MULTIPHASE HIGH VOLTAGE GENERATOR

Ellsworth M. Murley, Jr., Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 28, 1968, Ser. No. 755,930

Int. Cl.² H05B *41/24*

U.S. Cl. 315—169 TV **12 Claims**



1. A balanced, solid state high voltage, high power, low distortion generator for supplying at least a pair of 180° out of phase voltages to row-column conductor arrays, respectively, in a gas discharge display panel comprising, in combination,

a source of a pair of low voltage periodic voltages 180° out of phase with respect to each other,

a parallel pair of complementary push-pull transistor amplifiers, one of said push-pull transistor amplifiers of said

pair being connected to receive one of said low voltage periodic voltages, and the other of said pair of push-pull transistor amplifiers being connected to receive the other of said low voltage periodic voltages,

and at least a complementary pair of complementary high voltage transistor amplifiers connected back to back,

means connecting the output voltage of one of said parallel pair of complementary push-pull amplifiers to one of said back-to-back pair, and the other output voltage of the other of said parallel pair of complementary push-pull amplifier to the other of said back-to-back pair,

whereby the high output voltage of each amplifier of said back-to-back pair is 180° out of phase with respect to the other, with one of said output voltages being completely above ground reference and the other of said output voltages being completely below ground reference,

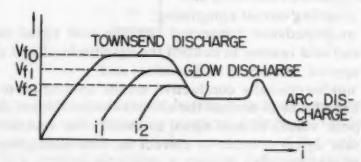
and high unidirectional voltage pulse circuit means coupling said 180° out of phase output voltages to said row-column conductor arrays, respectively.

3,944,875

GAS DISCHARGE DEVICE HAVING A FUNCTION OF SHIFTING DISCHARGE SPOTS

Kenichi Owaki; Toshinori Urade, both of Kobe, and Tadatsugu Hirose, Akashi, all of Japan, assignors to Fujitsu Limited, Japan

Continuation of Ser. No. 277,564, Aug. 3, 1972, abandoned. This application May 17, 1974, Ser. No. 470,932
Claims priority, application Japan, Aug. 10, 1971, 46-60432
Int. Cl.² H05B *37/00*
U.S. Cl. 315—169 TV **11 Claims**



1. A driving means for a display device utilizing gas discharge which includes a gap filled with ionizable gas, a plurality of electrodes arranged so as to provide elemental discharge areas in said gap, means for connecting said electrodes arranged at right angles to a shift direction of a discharge spot generated in said elemental discharge area to a plurality of buses periodically comprising:

a high frequency generator which generates a series of high frequency signals;

a group of first gate circuits, a first of the inputs of said first gate circuits being connected to the output of said high frequency generator and the outputs of said first gate circuits being connected respectively to said buses periodically;

a group of second gate circuits, a first of the inputs of said second gate circuits being connected to the output of said high frequency generator and outputs of said second gate circuits being connected respectively to different write electrodes;

a frequency divider which is connected to said high frequency generator;

a third gate circuit, one input of which is connected to said frequency divider, means for applying a start signal to another input of said third gate circuit;

a first ring counter the input of which is connected to said third gate circuit and the outputs of which are connected to a second of the inputs of said first gate circuits,

a second ring counter which is scanned by a first stage output of said first ring counter,

a diode matrix corresponding to one character, the vertical lines of which are respectively connected to the output of said second ring counter and the horizontal lines of which are respectively connected to a second of the inputs of said second gate circuits, and;

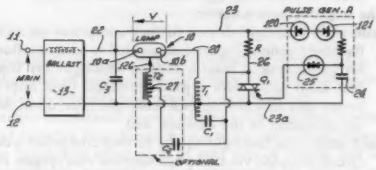
an AND circuit, two inputs of which receive respectively reset signals from said first and second ring counters and supply a stop signal to said third gate circuit.

3,944,876

RAPID STARTING OF GAS DISCHARGE LAMPS

James G. Helmuth, Monrovia, Calif., assignor to Chadwick-Helmuth Company, Inc., Monrovia, Calif.

Filed Sept. 30, 1974, Ser. No. 510,440
Int. Cl.² H05B *41/16, 41/24*
U.S. Cl. 315—205 **11 Claims**



1. In a starting device for a gas discharge lamp to which main AC voltage is supplied via lamp electrodes,

a. first means electrically connected with at least one lamp electrode to apply to the lamp a transient voltage pulse which initially changes in amplitude in a polarity direction relatively in opposition to the polarity of the main voltage simultaneously supplied to the electrodes,

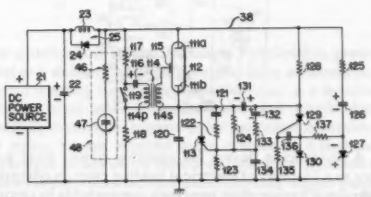
b. said first means including circuitry to cause said pulse to thereafter change in amplitude in a polarity direction in aid of the polarity of the main voltage simultaneously supplied to the electrodes, whereby the lamp may be re-started when hot.

3,944,877

WIRELESS MULTIFLASHLIGHT APPARATUS FOR A PHOTOGRAPHIC CAMERA

Fukuji Sato, Tokyo, Japan, assignor to Satoh Cohki Co., Ltd., Tokyo, Japan

Filed June 13, 1974, Ser. No. 479,111
Claims priority, application Japan, June 15, 1973, 48-67593
Int. Cl.² H05B *41/30*
U.S. Cl. 315—241 P **8 Claims**



1. In a wireless multiflashlight apparatus comprising:

a main flashlight device including a first flash capacitor on which a predetermined voltage is precharged, and a first flash tube coupled substantially across said first flash capacitor to emit a first flashlight ray for illuminating a subject being photographed through the discharge of the voltage precharged on said first flash capacitor upon the shutter operation of the camera; and

at least one additional flashlight device located in the neighborhood of the subject and away from said main flashlight device, said at least one additional flashlight device including a photoelectric conversion element operative to

receive flashlight rays emitted from said first flash tube, an amplifier section coupled to said photoelectric conversion element, a switching element coupled to said amplifier section to be made operative by an output signal from said amplifier section, and a flashlight source which includes a second flash capacitor on which a predetermined voltage is precharged, and a second flash tube coupled to said switching element and to said second flash capacitor to emit a flashlight ray for illuminating the subject simultaneously with that from said first flash tube through the discharge of the voltage precharged on said second flash capacitor when a flashlight ray delivered from said first flash tube is received by said photoelectric conversion element and said switching element is made operative by an output signal from said photoelectric conversion element obtained through said amplifier section;

the improvement wherein:

said main flashlight device further comprises an additional flashlight generating means coupled to said first flash tube for generating at least a second flashlight ray from said first flash tube, with a predetermined time interval between said first and second flashlight rays, upon the shutter operation of the camera; and

said additional flashlight device further comprises a decoder circuit coupled via said photoelectric conversion element between said amplifier section and said switching element for producing an output signal only responsive to at leas. two flashlight rays delivered from said main flashlight device being received by said photoelectric conversion element with said predetermined time interval therebetween, said output signal being coupled to said switching element for causing said switching element to become operative to cause a flashlight ray to be emitted from said second flash tube.

3,944,878

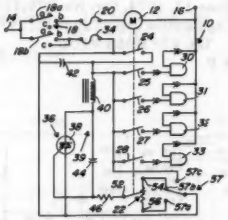
VARIABLE BRIGHTNESS LIGHT DISPLAY APPARATUS

Basil G. Gerontakis, 32 N. Belmont, Arlington Heights, Ill. 60004

Filed Nov. 1, 1974, Ser. No. 519,915

Int. Cl.² H05B *39/00, 37/00*

U.S. Cl. 315—316 **17 Claims**



1. A sequencing device for applying power from a power source to a plurality of electrical lighting circuits comprising:

a thyristor having main terminals connectable in circuit with said power source and said electrical lighting circuits, and a control terminal;

a plurality of sequencing switches each connected in circuit with said thyristor and one of said lighting circuits for selectively connecting one of said lighting circuits in circuit with said thyristor;

a variable impedance element electrically coupled to said control terminal for varying the flow of current through said main terminals; and

sequencing means operatively coupled to said variable impedance element and to said sequencing switches for simultaneously varying the impedance of said variable impedance element and selectively connecting said thyristor in series with predetermined ones of said electrical lighting circuits in a predetermined sequence.

3,944,879

PIN CUSHION DISTORTION CORRECTION CIRCUIT

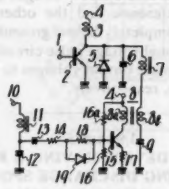
Masao Suzuki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 16, 1974, Ser. No. 470,654

Claims priority, application Japan, May 19, 1973, 48-59022[U]

Int. Cl.² H01J *29/56*

U.S. Cl. 315—370 **9 Claims**



1. A correction circuit for correction of pin cushion distortion of the sides of a television raster, said circuit comprising:

A. a horizontal deflection circuit;

B. a source of signal synchronous with the vertical deflection frequency of said raster, said signal having a generally parabolic waveform;

C. a saturable reactor connected to said deflection circuit to modify the horizontal deflection current to correct said pin cushion distortion; and

D. a coupling circuit comprising:

1. an impedance connected between said signal source and said reactor to control the amplitude of said signal applied to control said reactor, and

2. unidirectionally conductive means connected to said impedance to control the effective value thereof during peak values of said signal to modify the waveform of said signal in order to correct for non-linear response of said reactor.

3,944,880

CATHODE RAY TUBE DEVICE OF PREHEATED TYPE

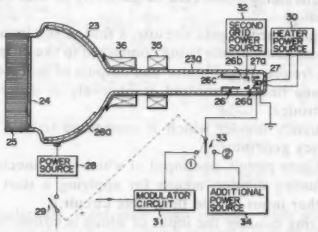
Norio Harao; Yoshiharu Obata, both of Yokohama, and Tatsuo Yamaguchi, Machida, all of Japan, assignors to Tokyo Shibaura Electric Co, Ltd., Kawasaki, Japan

Filed May 13, 1974, Ser. No. 469,505

Claims priority, application Japan, May 15, 1973, 48-53138; May 16, 1973, 48-53516

Int. Cl.² H01J *29/70*

U.S. Cl. 315—380 **6 Claims**



1. In a cathode ray tube device including a cathode ray tube having a tube with a faceplate, an electron gun assembly including first and second grids and a cathode from which an electron beam is emitted and operating means including an

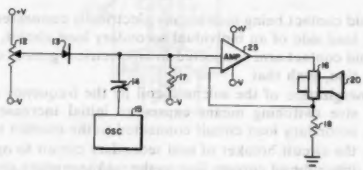
anode and deflecting means for allowing the electron beam to scan the faceplate in a normal operating state of the device, and an electric circuit for driving said operating means, including a heater power source for heating the cathode in the normal operating state of the device and a waiting state of the device where the electron beam does not scan the faceplate, the improvement which comprises introducing means for introducing the electron beam from the cathode without scanning the faceplate by the electron beam while the device is kept in the waiting state and wherein the cathode ray tube consists of a fiber optics cathode ray tube including a fluorescent surface on the faceplate on one side of an optical fiber bundle and the cathode has an electron emissive layer made of oxide layer emitting a beam current of 5 to 100 mA/cm² density.

3,944,881

VERTICAL CENTERING CONTROL CIRCUIT

David P. Lynch, Driver, Va., assignor to General Electric Company, Portsmouth, Va.

Filed May 10, 1974, Ser. No. 469,010
Int. Cl.² H01J 29/54
U.S. Cl. 315—398 **4 Claims**



1. In a television receiver having a cathode ray tube and a deflection circuit including vertical deflection windings for deflecting the one or more electron beams of the cathode ray tube in a vertical direction, a vertical deflection drive circuit comprising:

a source of sweep signal varying at the desired vertical sweep rate,

an amplifier having an input and an output, said input being responsive to said sweep signal enabling said output to apply an amplified sweep signal to said vertical deflection windings,

a vertical centering control coupled to said input to apply a controllable DC voltage to said amplifier,

and time constant means coupled to said source and to said input, said time constant means including means having the characteristic of a diode to shorten the response time of said amplifier to vertical centering control adjustment and to provide a time constant for said sweep signal of sufficient duration to linearize the shape of the sweep portions thereof.

3,944,882

CENTERING CIRCUITS EMPLOYED FOR BEAM DEFLECTION CIRCUITS

Shigenori Takahashi, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 7, 1974, Ser. No. 512,905
Claims priority, application Japan, Oct. 11, 1973, 48-118138
Int. Cl.² H01J 29/70
U.S. Cl. 315—398 **5 Claims**

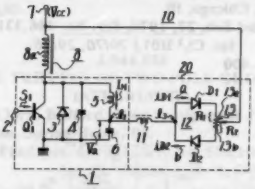
1. A circuit arrangement for use in connection with a cathode ray tube comprising:

a. a deflection coil for deflecting an electron beam in the cathode ray tube;

b. a capacitor connected in series to said deflection coil;

c. means connected between a pair of reference potential terminals for supplying a deflection current of substantially sawtoothed waveform to said deflection coil;

d. inductance means with one end connected to a connecting point between said deflection coil and said capacitor;



e. a pair of diodes with respective one ends connected to the other end of said inductance means so as to dispose both diodes in parallel with opposite polarity; and

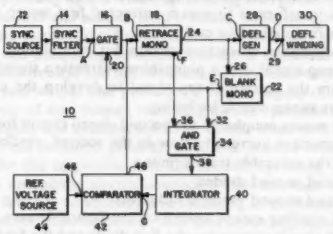
f. variable impedance means having a controllable terminal, said variable impedance means being connected between the respective other ends of said pair of diodes and said controllable terminal being connected to one of said reference potential terminals.

3,944,883

RETRACE PULSE GENERATOR HAVING IMPROVED NOISE IMMUNITY

Michael Lee Henley, Indianapolis, and Lawrence Edward Smith, Noblesville, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 2, 1974, Ser. No. 528,619
Int. Cl.² H01J 29/72
U.S. Cl. 315—399 **3 Claims**



1. In a deflection system including a deflection generator coupled to a deflection winding for providing a current in said deflection winding having a magnitude which is a function of the elapsed time after a retrace pulse and which changes substantially linearly, a retrace pulse generator comprising:

first gating means, adapted to be coupled to a first source of trigger pulses which produces pulses having a first time interval therebetween, for providing said trigger pulses at an output terminal in the absence of a gate disabling signal;

first monostable means coupled to said output terminal of said first gating means for developing said retrace pulse in response to each of said trigger pulses;

second monostable means coupled to said first gating means and said first monostable means for providing, in response to said retrace pulse, said gate disabling signal during a second time interval which is less than said first time interval; and

means coupled to said first and second monostable means for developing second trigger pulses, thereby producing said retrace pulse, when said trigger pulses produced by said first source have a time interval therebetween which

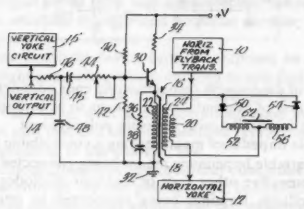
is at least a predetermined time interval greater than said first time interval.

3,944,884

ADJUSTABLE PINCUSHION CORRECTION CIRCUIT

Richard L. Wilocki, Elk Grove, Ill., assignor to Warwick Electronics Inc., Chicago, Ill.

Filed Feb. 27, 1974, Ser. No. 446,321
Int. Cl.[2] H01J 29/70, 29/76
U.S. Cl. 315—400 12 Claims



1. In a television receiver having first and second deflection coils for generating a raster, a first sweep circuit for supplying a first sweep signal for the first deflection coil, and a second sweep circuit for supplying a second sweep signal for the second deflection coil, a pincushion correction circuit, comprising:

a saturable transformer having a saturable magnetic core, a first winding means wound on the saturable core, and a second winding means wound on the saturable core;

a deflection circuit coupling the first sweep circuit to the first deflection coil through the first winding of the saturable transformer to pass a corrected first sweep signal to the first deflection coil;

an adjustable correction means for modulating the first sweep signal with a pincushion correction signal derived from the second sweep signal to develop the corrected first sweep signal, including

drive means coupled to the second sweep circuit for causing correction current to flow in the second winding means of the saturable transformer,

first and second diodes,

first and second variable inductors,

third winding means wound on the saturable core,

a first circuit connecting the first diode and the first variable inductor to the third winding means for passing current during a start portion of the second sweep signal and with a variable magnitude controllable by the first variable inductor, and

a second circuit connecting the second diode and the second variable inductor to the third winding means for passing current during an end portion of the second sweep signal and with a variable magnitude controllable by the second variable inductor, whereby the current in said second and third windings means provides separately controllable pincushion correction at the sides of the raster.

3,944,885

ELECTRIC LOAD RESTRICTION UNIT

Robert H. Sparling, Salida, Colo., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Oct. 22, 1974, Ser. No. 516,890
Int. Cl.[2] H02J 3/14
U.S. Cl. 317—9 R 2 Claims

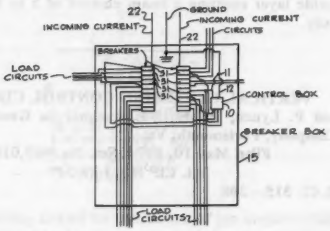
1. An electrical mechanism for reducing the secondary load of an overloaded primary electrical power supply comprising:

a primary electrical power supply circuit connected to a source of alternating current, the frequency of which is reduced when the said primary circuit is overloaded,

a plurality of secondary electrical circuits each connected to the primary circuit by an individual circuit breaker,

a solenoid fitted with a contact arm actuated by an electrical coil, and fitted with a contact engaged by the contact arm only when the coil is energized,

electrical switching means responsive to electrical line frequency, which energizes the solenoid coil when the connected line frequency falls below a pre-selected valve,



said contact being individually electrically connected to the load side of an individual secondary load circuit, and

said contact arm connected to an electrical ground connection, such that

energization of the solenoid coil by the frequency responsive switching means causes an initial increase in the secondary load circuit connected to the contact to cause the circuit breaker of said secondary circuit to open and interrupt all current flow to the said secondary circuit, so as to reduce the load of the primary electrical power supply circuit.

3,944,886

PROTECTION APPARATUS FOR A CAPACITOR CONNECTED IN SERIES WITH AN ELECTRIC POWER CIRCUIT

Yotsuo Ishida, Ebina; Takeo Okazaki, Kawasaki; Hajime Matsumura, Yokohama; Shinichi Menju, Atsugi, and Iwao Ohshima, Yokohama, all of Japan, assignors to Tokyo Electric Power Company, Ltd. and Tokyo Shibaura Electric Company, Ltd., both of Tokyo, Japan

Filed Jan. 24, 1975, Ser. No. 543,801
Int. Cl.[2] H02H 7/16
U.S. Cl. 317—12 A 8 Claims

1. A protecting apparatus for a capacitor connected in series with an electric power circuit for improvement of the power factor thereof comprising:

a protecting gap assembly connected in parallel with the capacitor to bypass the capacitor current by discharging it in response to a predetermined excess voltage across the capacitor when an abnormall excess current flows through the capacitor,

a bypass switch for short circuiting the gap assembly with the capacitor in response to the discharge current flowing through the gap assembly,

the bypass switch being provided with a pair of contacts aligned with each other in faced relation to effect on-off operation,

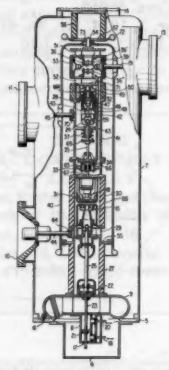
a fluid operational driving cylinder combined with one of the contacts of the bypass switch,

an electromagnetic repulsion means combined with either one of the contacts for generating an electromagnetic repulsion force in response to the capacitor discharge current flowing through the protecting gap device to move one contact towards the other contact to make the contacts independent of the drivinng cylinder,

the discharge gap device, the electromagnetic repulsion device and the pair of contacts being aligned along an axis so that the discharge gap device assumes the uppermost position,

a concentric cylindrical member made of an electrically conductive material and mounted around the aligned parts,

the cylindrical member having one closed end positioned at the side of the discharge gap device and one open end positioned at the side of the driving cylinder for the bypass switch,



the cylindrical member being connected in parallel with the aligned parts to provide a current path including the gap device and a magnetic repulsion winding of the electromagnetic repulsion device for discharging the capacitor current until the capacitor bypass switch closes its contacts, and

an enclosure filled with an electric insulating gas and enclosing the discharge device, the electromagnetic repulsion means and the gap bypass switch therein.

3,944,887

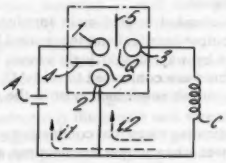
CROWBAR SWITCH

Yasuo Suzuki, Kyoto, Japan, assignor to Nissin Electric Co., Ltd., Kyoto, Japan

Filed June 3, 1974, Ser. No. 475,509

Int. Cl.² H02H *9/06*

U.S. Cl. 317—16 **10 Claims**



5. A crowbar switch circuit, comprising:

electrical energy storage means;

electrical load means;

a start switch gap connected between energy storage means and said electrical load means for conducting energy stored in said storage means to said electrical load means when said start switch gap is fired and assumes a condition of discharge therein;

a crowbar switch gap, said crowbar switch gap being connected across said electrical load means for short circuiting said load means when said crowbar switch gap is fired, said start switch gap and said crowbar switch gap being positioned close to one another such that said condition of discharge in said start switch gap ionizes ambient gas about said crowbar switch gap thereby reducing the time and energy necessary to fire said crowbar switch gap; and

means for firing said start switch gap and said crowbar switch gap.

3,944,888

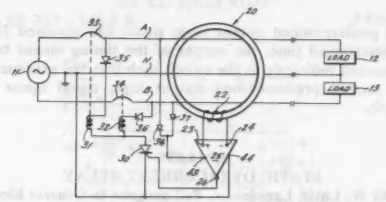
SELECTIVE TRIPPING OF TWO-POLE GROUND FAULT INTERRUPTER

William R. Clark, Bedford, Mass., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Oct. 4, 1974, Ser. No. 512,106

Int. Cl.² H02H *3/28*

U.S. Cl. 317—18 D **10 Claims**



1. A ground fault detector-interrupter for a single phase three wire electrical system having a neutral conductor and first and second hot conductors at potentials of opposite polarities with respect to the neutral conductor; said detector-interrupter including first and second switch means in series with the respective first and second hot conductors, first and second operating means which upon being energized open the respective first and second switch means, detector means for monitoring current conditions at said neautral and hot conductors, and producing an output related to unbalanced currents in said neutral and hot conductors, control means which receives said output and produces a control signal related to the polarity of said output, switching means operated by said control signal and constructed to be closed when said output is of a predetermined polarity, first and second energizing circuits for the respective first and second operating means, said first energizing circuit connected between said neutral and said first hot conductors and including in electrical series a first semi-conductor means, said first operating means and said switching means, said second energizing circuit connected between said neutral and said second hot conductors and including in electrical series a second semi-conductor means, said second operating means and said switching means; each of said semi-conductors being connected in circuit to conduct and thereby permit energization of the operating means in circuit therewith when the hot conductor connected thereto is of said predetermined polarity and said switching means is closed.

3,944,889

SHORT-CIRCUIT PROTECTION CIRCUIT

David Conway, Exeter, England, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 6, 1974, Ser. No. 530,266

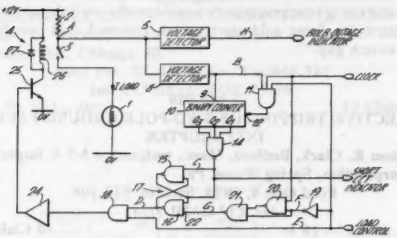
Claims priority, application United Kingdom, Dec. 22, 1973, 59711/73

Int. Cl.² H02H *3/24*

U.S. Cl. 317—31 **12 Claims**

1. A short-circuit protection circuit for detecting a high short circuit direct current flowing through an electric switch to a load and opening the switch, comprising a voltage detector connectible to the live side of the load and providing a first

predetermined output logic signal when the detected voltage is in the vicinity of zero, the output of the voltage detector being connected to the input of a timing means adapted to provide a second predetermined output logic signal after the



first predetermined output logic signal has persisted for a predetermined time, the output of the timing means being connected indirectly to the switch such that the existence of the second predetermined output logic signal opens the switch.

3,944,890

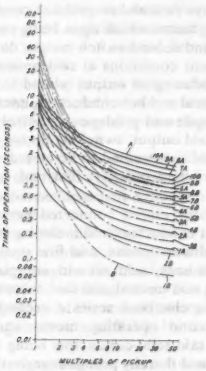
STATIC OVERCURRENT RELAY

David W. Little, Lansdowne, Pa., assignor to General Electric Co., Philadelphia, Pa.

Filed Sept. 10, 1974, Ser. No. 504,772

Int. Cl.² H02H 3/08

U.S. Cl. 317—36 TD **11 Claims**



1. A protective relay adapted to be coupled to an alternating current circuit for producing a trip signal in delayed response to the value of a circuit quantity becoming excessive, said relay comprising:

a. means for deriving from said circuit a unipolar input signal of variable amplitude representative of said quantity;

b. means for providing a predetermined bias signal of relatively low magnitude;

c. function generating means to which said input signal and said bias signal are supplied in polarity opposition, said function generating means being operative to produce an output signal which varies as a non-linear function of the sum of said signals,

d. means connected to said function generating means and operative whenever the value of said circuit quantity becomes excessive for integrating said output signal in order to produce an integrated output signal; and

e. means connected to said integrating means capable of producing a trip signal if the integrated output signal exceeds a preselected level.

3,944,891

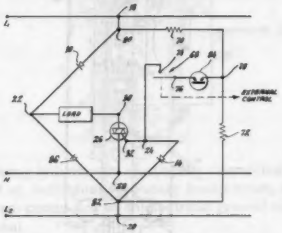
CIRCUIT FOR VERIFYING CORRECT CONNECTIONS TO A THREE-WIRE DUAL VOLTAGE POWER DISTRIBUTION SYSTEM AND THE ABSENCE OF OPEN CIRCUIT CONDITIONS THEREIN

Thomas Michael McDonald, 223 Wheeler Road, Monroe, Conn. 06468, and Paul Muchnick, One Huckleberry Drive North, Norwalk, Conn. 06058

Filed Apr. 3, 1974, Ser. No. 457,575

Int. Cl.² H02H 3/26

U.S. Cl. 317—48 **13 Claims**



1. The combination of a logic circuit for use with a three-wire AC power distribution system to verify proper connections thereto or open circuit conditions therein and a ground fault sensing circuit, the power distribution system having two nongrounded lines and a neutral line, said logic circuit comprising:

semiconductor switching means having conductive and nonconductive states for selectively interrupting current flow therethrough;

polarity-responsive means for synchronizing the states of said switching means with conditions of opposite voltage polarities in the nongrounded lines relative to the neutral line, said polarity-responsive means rendering said switching means nonconductive when conditions of opposite voltage polarities fail to exist in the nongrounding lines of the power distribution system;

said switching means having first and second main terminals and a control terminal, said polarity-responsive means having plural AC input terminals and plural DC output terminals, said control terminal coupled to one of said DC output terminals;

a load series coupled to said main terminals between the other DC output terminal and the neutral line and receiving current by way of said logic circuit when the nongrounded lines are connected to said AC input terminals if no open circuit conditions exist in the power distribution system;

means for indicating electrical conductivity coupled as said load to detect when proper connections are made to the power distribution system or open circuit conditions exist therein, said indicating means comprising first and second coils mounted in a circuit breaker, said breaker having breaker poles electromechanically linked with said first coil to open when the energizing voltage of said first coil is below a predetermined minimum level and said breaker poles being electromechanically linked with said second coil to open when energizing voltage is applied to said second coil;

latching means for holding said switching means in a conductive state when open circuit conditions exist in one nongrounded line of the power distribution system;

said latching means including an externally controlled switching means for interrupting current flow and means for dividing a voltage into equal magnitudes, said externally controlled switching means having wiring terminals across which electrical conductivity is interrupted, said voltage dividing means having input terminals and a center tap terminal at the divided voltage level, said input terminals being connected to said AC input terminals, said wiring terminals being connected between said control terminal and said center tap terminal, said center tap terminal attaining a voltage level relative to the neutral line when open circuit conditions exist in either nongrounded line of the power distribution system, said voltage level holding said switching means in a conductive state when said externally controlled switching means is closed to conduct current therethrough; and

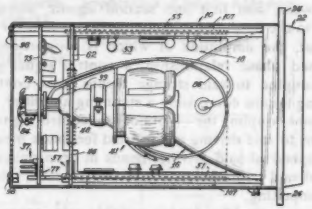
a ground fault sensing circuit connected to energize said second coil when current leakage to ground of predetermined magnitude occurs in the power distribution system.

3,944,892

SMALL COMPACT CATHODE RAY OSCILLOSCOPE ASSEMBLY

Richard A. Johnson, Round Lake, and Douglas E. Scott, Round Lake Beach, both of Ill., assignors to Norcon Electronic Laboratories, Inc., Round Lake, Ill.

Filed Oct. 21, 1974, Ser. No. 516,694
Int. Cl.² H05K 7/06; H04N 5/64
U.S. Cl. 317—120 **11 Claims**



1. An oscilloscope assembly connected to input means conveying electrical input signals and electrical power thereto, comprising:

a cathode ray oscilloscope tube having a screen and having a rearwardly extending longitudinal neck portion connected electrically to said input means for supplying power thereto, said tube being adapted to establish an electron beam for illuminating the face of said screen;

deflecting means mounted on said neck portion and connected electrically to said input means for diverting selectively the path of travel of said beam;

a plurality of control circuit elements connected electrically to said deflection means and connected electrically to said input means for energizing selectively said deflection means to selectively illuminate said screen in response to said input signals;

a rear end circuit panel fixedly connected to said tube and extending transversely to said neck portion, said rear end panel supporting a portion of said control circuit elements, the height and width of the face of said rear panel being less than the corresponding height and width of said screen;

a plurality of side circuit panels extending forwardly from said rear panel toward said screen parallel to the axis of said neck portion and forming an open boxlike configuration with said rear end panel, said boxlike configuration at least partially receiving said neck portion, said side panels each supporting other portions of said control circuit elements;

female and male connecting means interconnecting mechanically the adjoining marginal edges of said side panels to said rear panel and interconnecting electrically the circuit elements supported by said rear end and side panels, said female connecting means being each mounted to said side panels, said male connecting means being mounted on said rear end panel; and

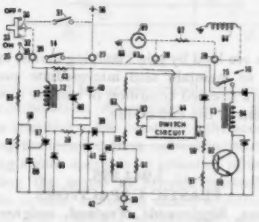
a housing having an open front end portion receiving said screen and confining at least partially said tube, said deflection means, said circuit elements, said panels and said connecting means.

3,944,893

VEHICLE WINDOW HEATER CONTROL DEVICE

Rodney Hayden, Stoney Creek, Canada, assignor to TRW Inc., Cleveland, Ohio

Filed Oct. 29, 1974, Ser. No. 518,532
Claims priority, application Canada, Oct. 29, 1973, 184419
Int. Cl.² H02H 47/32
U.S. Cl. 317—148.5 R **3 Claims**



1. A control device for an automotive window heater energized by an alternator having a field winding and comprising: a manual switch terminal, an ignition terminal, a battery terminal, an indicator terminal, a field winding terminal and a ground terminal; a first normally open relay having a winding and a first normally open armature switch; a triggerable switch device electrically in series with said first relay winding between said ignition terminal and ground; a trigger circuit for said triggerable switch electrically disposed between ground and said manual switch terminal; a timing circuit including a chargeable condenser; a second relay having a winding and a second normally open armature switch; and a voltage responsive switch responsive to a voltage greater than a predetermined value and electrically in series with said winding of said second relay between ground and said indicator terminal; said first and second relay switches when closed connecting said indicator terminal respectively to said battery terminal and said field winding terminal.

3,944,894

ELECTROLYTIC TIMER CAPSULE WITH RUPTURABLE FILAMENT ANODE

John Paul Jones, Jr., Wayne, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed June 19, 1973, Ser. No. 371,515
Int. Cl.² H01G 9/18
U.S. Cl. 317—232 **4 Claims**

1. An electrolytic timing capsule, comprising in combination, an electrolyte solution, a cup-like insulator containing said solution with a continuous filament anode element with an intermediate portion extending through the insulator into said solution with two terminal leads extending from said insulator outside said solution as terminals to detect discontinuity of the filament portion therebetween, a cathode element having a planar surface in contact with said solution arranged to close the cup-like insulator structure, said cup-like insulator comprising a resilient electrically insulating element confining said solution in a cup-like compartment holding the electro-

lyte disposed between said anode and cathode, and clamping means formed by configuration of said cathode for pressing said cathode and insulating element together in a hermetic sealed housing arrangement confining said solution wherein

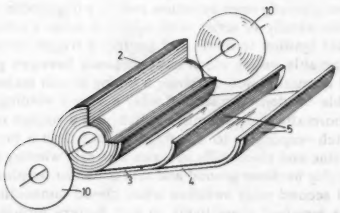
the two leads are held by said clamping means in said insulating element to maintain said intermediate portion in said electrolyte in a stressed condition of a sense assisting rupture of said filament at the end-of-life.

3,944,895

PLASTIC CAPACITORS

Colin Williams, Biggleswade, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Feb. 21, 1974, Ser. No. 401,611
Int. Cl.² H01G 4/18
U.S. Cl. 317—258 **10 Claims**



1. A wound, thermally stabilized electrical capacitor comprising at least a pair of electrically conductive electrodes, an insulating dielectric spacer disposed therebetween, the electrodes and spacer being wound together to form the capacitor winding, and a constrictive sleeve enveloping the winding, wherein

a. the spacer comprises a longitudinal thermoplastic polymeric film strip having (1) a thermal shrinkage in the longitudinal direction of from 5.0 to 10 percent, and (2) a ratio of thermal shrinkage in the longitudinal direction to that in a direction at right angles thereto of from 1.7:1 to 10:1, and

b. the sleeve (1) extends over at least 75 percent of the exposed surface area of the capacitor winding, and (2) is of a material having a thermal shrinkage in the longitudinal direction at least 1.02 times that of the spacer,

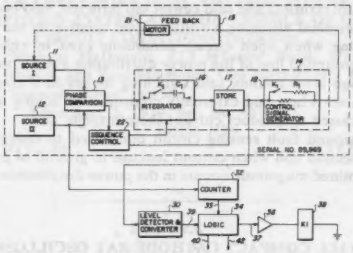
said thermal shrinkages being determined at the thermal stabilizing temperature.

3,944,896

PHASE SYNCHRONIZATION SYSTEM WITH START-UP SEQUENCING AND AUTOMATIC SHUT-DOWN

Victor Rodek, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 8, 1974, Ser. No. 467,967
Int. Cl.² H02D 5/50
U.S. Cl. 318—85 **9 Claims**



1. In apparatus for synchronizing the velocity of first and second movable members including driving means mechanically coupled to said first movable member, first and second detecting means for deriving first and second signals representative of the velocities of said first and second movable members, respectively, comparison means coupled to said first and second detecting means for determining the phase relationship between said first and second signals, storage means coupled to the output of said comparison means for providing an output, the amplitude of which is proportional to said determined phase relationship, a control signal generating means coupled to said storage means, said control signal generating means comprising a summing amplifier, and feedback means coupling the output of said control signal generating means to said driving means, said feedback means adjusting the speed of said driving means in accordance with the output of said control signal generating means, the improvement comprising:

a summing amplifier having variable gain means,

means for adjusting the gain of said variable gain means to a first value when said synchronizing apparatus is initially energized,

means for measuring said storage means output and generating an output signal if said storage means output is greater than a predetermined level,

first means coupled to the output of said measuring means for adjusting the gain of said variable gain means to a second value if an output signal is not generated by said measuring means, and

second means coupled to the output of said measuring means for reducing the velocity of said driving means to substantially zero if an output signal is generated by said measuring means.

3,944,897

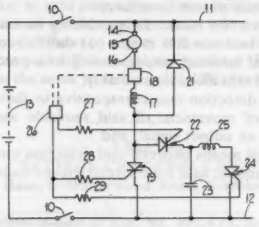
CONTROL CIRCUITS FOR ELECTRICALLY DRIVEN VEHICLES

Maurice James Wright, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed June 14, 1974, Ser. No. 479,555
Claims priority, application United Kingdom, June 30, 1973, 31313/73
Int. Cl.² H02P 7/06
U.S. Cl. 318—139 **4 Claims**

1. A control circuit for an electrically driven vehicle comprising in combination a traction motor for driving the vehicle, first contactor means for connecting the motor in circuit to provide forward drive, second contactor means for connecting the motor in circuit to provide electrical braking, control

means determining the current in the motor armature, and a control pedal controlling both the selection of the contactor means and the control means to control the level of current in



the motor armature in accordance with the setting of the control pedal and the contactor means which has been selected.

3,944,898

CONTROL CIRCUITS FOR ELECTRICALLY DRIVEN VEHICLES

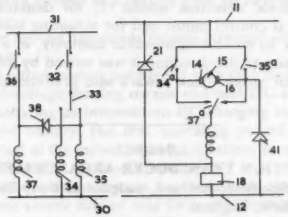
Maurice James Wright, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed June 14, 1974, Ser. No. 479,532

Claims priority, application United Kingdom, June 30, 1973, 31298/73

Int. Cl.² H02P *3/12*

U.S. Cl. 318—258 **1 Claim**



1. A control circuit for an electrically driven vehicle, comprising in combination positive and negative supply lines for connection to a traction battery on the vehicle, a traction motor, a first contactor which when closed connects one side of the motor armature to the positive supply line, a second contactor which when closed connects the other side of the motor to the positive supply line, a series connection of a field winding and a chopper circuit, a two-position contact having first and second positions in which it connects said one and said other sides of the motor to the negative supply line respectively through said field winding and chopper circuit, a diode through the cathode-anode path of which said other side of the motor is coupled to the negative supply line, a second diode coupling the junction between said field winding and chopper circuit to said positive supply line, and means whereby when it is desired to drive the vehicle forwardly the first and second contactors are closed and opened respectively and said contact is in its second position, but when it is desired to drive the vehicle rearwardly, the first and second contactors are opened and closed respectively and the contact is in said first position, and when it is desired to brake the vehicle electrically while it is being driven forwardly the first and second contactors are open and the contact is in said first position.

3,944,899

CONTROL CIRCUIT FOR ELECTRICALLY DRIVEN VEHICLES

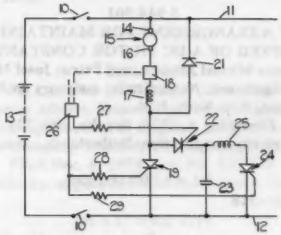
Maurice James Wright, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed June 14, 1974, Ser. No. 479,528

Claims priority, application United Kingdom, June 30, 1973, 31303/73

Int. Cl.² H02P *5/16*

U.S. Cl. 318—269 **4 Claims**



1. A control circuit for an electrically driven vehicle comprising in combination: A traction motor; an accelerator pedal; means sensitive to the position of the accelerator pedal for controlling the forward drive current to the motor; a brake pedal; braking means operable on actuation of the brake pedal for connecting the motor to provide controlled electrical braking of the vehicle; inhibiting means sensitive to the speed of the vehicle and inhibiting initiation of operation of said braking means when the brake pedal is actuated while the vehicle speed is below a predetermined value; and means for maintaining electrical braking, once commenced, after the vehicle speed falls below the predetermined level.

3,944,900

CONTROL CIRCUITS FOR ELECTRICALLY DRIVEN VEHICLES

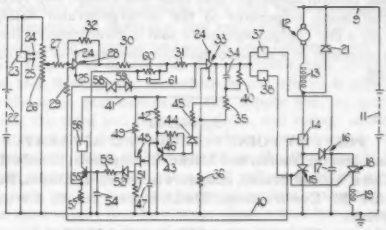
Ivor Carl Rohsler, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed June 5, 1974, Ser. No. 476,556

Claims priority, application United Kingdom, June 6, 1973, 27010/73

Int. Cl.² H02P *5/16*

U.S. Cl. 318—317 **1 Claim**



1. A control circuit for an electrically driven vehicle, comprising in combination a traction motor driving the vehicle, a thyristor chopper circuit controlling the speed of the traction motor, said chopper circuit including a main thyristor in series with the motor, and a commutating thyristor which when fired turns off the main thyristor, means controlling the instants of firing of the thyristors to regulate the mean current flow in the motor, said means including an operational amplifier having first and second states, the operational amplifier serving when

it is driven from its first state to its second state to fire the main thyristor, and serving when it is driven from its second state to its first state to fire the commutating thyristor, means for sensing current flow through said motor and for driving said operational amplifier to said first state when a predetermined current level is sensed through said motor, the circuit further including delay means which operates when the main thyristor is fired and when the current through said current sensing means is below said predetermined level for driving said operational amplifier to its first state after a predetermined delay.

3,944,901
CIRCUIT ARRANGEMENT FOR MAINTAINING THE SPEED OF A DC MOTOR CONSTANT

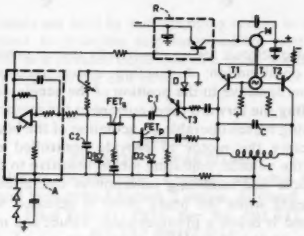
Peter Johannes Michiel Janssen, and Petrus Josef Maria Aarts, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 2, 1974, Ser. No. 466,221

Claims priority, application Netherlands, Jan. 26, 1974, 7401099

Int. Cl.² H02P *5/06*

U.S. Cl. 318—318 **8 Claims**



1. A system for regulating the speed of a dc motor at a desired speed comprising, a control amplifier connected in series with the motor winding for controlling the current supplied to said winding, the motor driving a tacho-generator which supplies a voltage whose frequency is directly proportional to the speed of the tacho-generator, a filter comprising a tuned circuit having a resonant frequency equal to the tacho-generator frequency at the desired motor speed and which attenuates other frequencies, means for coupling the tacho-generator voltage via said filter to a charge pump rectifying circuit having an output connected to the control input of the control amplifier, said filter and charge pup rectifying circuit being responsive to the tacho-generator voltage to supply a DC control voltage to said control input of the control amplifier in a sense to maintain the motor at said desired speed.

3,944,902
POINT BY POINT POSITIONING APPARATUS

Jean Lacorre, Nantes, and Michel Champenois, St Sebastien S. Loire, both of France, assignors to Societe D'Etudes, Recherches Et Constructions Electroniques Sercel, Carquefou, France

Filed July 30, 1973, Ser. No. 383,866

Claims priority, application France, Aug. 17, 1972, 72.29426

Int. Cl.² G05B *11/18*

U.S. Cl. 318—593 **9 Claims**

1. A positioning apparatus for positioning a movable assembly, comprising:

a. a general control motor for moving said movable assembly,

b. a stepping motor for moving said movable assembly,

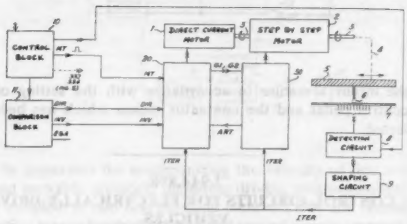
c. a stationary linear detection instrument including a series of transverse conductive lamellae insulated from one another, each adjacent pair of lamellae defining a different predetermined position along the path of travel of the movable assembly,

d. means movable with the movable assembly and cooperable with said lamellae for successively short circuiting adjacent pairs of said lamellae,

e. detection circuit means for producing an output signal only when said movable means (d) short circuts an adjacent pair of lamellae corresponding to a predetermined position of said movable assembly,

f. additional detection means responsive to the reversal of direction of movement of said movable assembly for producing an output signal, and

g. logic circuit means between said detection circuit means and said motors, said logic circuit means including:



I. means for actuating said general control motor to move said movable assembly into a predetermined position and then past that position,

II. means responsive to the output signal from said detection circuit means (e) for braking said general control motor and hence said movable assembly, and

III. means responsive to said output signal from said additional detection means (f) for deactuating said general control motor and for actuating said stepping motor to move said movable assembly, in a direction opposite to the direction it was moved by said general control motor, back toward said predetermined position.

3,944,903
POSITION TRANSDUCER ARRANGEMENT

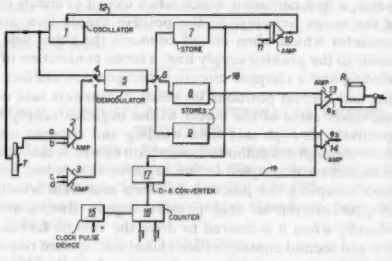
Roy Clegg, Sheffield, England, assignor to Davy-Loewy Limited, Sheffield, England

Filed Jan. 16, 1974, Ser. No. 433,658

Claims priority, application United Kingdom, Jan. 16, 1973, 2176/73

Int. Cl.² G05B *1/01*

U.S. Cl. 318—606 **11 Claims**



1. A position transducer circuit comprising at least one AC position transducer having an input and an output, a variable amplitude oscillator connected to the input of the transducer, the output of the oscillator and the output of the transducer

connected to respective switch inputs of a demodulator, the output of the demodulator connected through separate output switches to respective stores, means for switching said demodulator input and output switches together and in sequence to connect said oscillator and the transducer in turn through the demodulator to said respective stores, means for comparing the signal in said oscillator signal store with a reference signal to produce a difference signal and means in the oscillator responsive to said difference signal to adjust the output of the oscillator in the sense to reduce said difference signal substantially to zero.

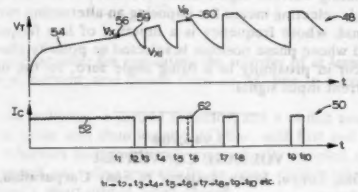
3,944,904
BATTERY CHARGING CIRCUIT

Alfred M. Hase, 6 Manorwood Road, Scarborough, Ontario, Canada

Continuation-in-part of Ser. No. 400,429, Sept. 24, 1973, abandoned. This application May 7, 1975, Ser. No. 575,125

Int. Cl.² H02J 7/04

U.S. Cl. 320—23 **7 Claims**



1. A battery charging circuit for charging storage batteries, including;

DC circuit means for supplying an initial constant DC charging current to a battery from an alternating current source;

first and second adjustable battery terminal voltage sensing means;

control circuit means connected with said first battery terminal voltage sensing means and said DC circuit means for initiating an intermittent DC charging current supply to said battery, the first operating period of which is initiated at the instant when said battery terminal voltage reaches a first predetermined level;

synchronous switch means connected in the alternating current source side of said DC circuit means;

gate means connected to said first and second battery terminal voltage sensing means and to said synchronous switch means, said gate means being adapted to control said synchronous switch means so as to initiate and stop the supply of alternating current to the DC circuit means and thereby to control each operating period of time of said intermittent DC charging current supply; and

a timing circuit which is connected to said gate means so as to control the length of each operating period of time including the first operating period of time, of said DC circuit means after said intermittent DC charging current supply has been initiated;

said second battery terminal voltage sensing means being connected to said gate means and adapted to operate after the first operating period of time of said DC circuit means; said second voltage sensing means being set to initiate an operating period of said intermittent DC charging current supply each time the battery terminal voltage reaches a second predetermined battery terminal voltage level which is below said first predetermined voltage level.

6. The method of charging a storage battery including the steps of:

supplying an initial constant DC charging current to the battery until the terminal voltage thereof reaches a first predetermined level; then immediately initiating the first operating period of an intermittent supply of DC charging current to the battery, where each operating period of said intermittent supply of DC charging current supplied to said battery is predetermined; and

at the same time as said intermittent supply of DC charging current is initiated, simultaneously beginning operation of voltage sensing gate means which senses the terminal voltage of said battery and starts each subsequent operating period of said intermittent DC charging current whenever the terminal voltage of said battery reaches a second predetermined level which is below said first predetermined level.

3,944,905
BATTERY CHARGING SYSTEMS FOR ROAD VEHICLES

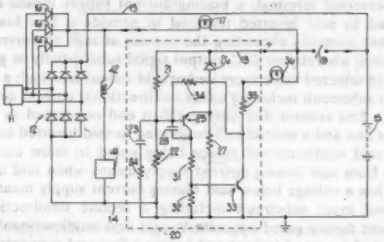
Maurice James Allport, Stourbridge, and David Gordon Williams, Birmingham, both of England, assignors to The Lucas Electrical Company Limited, Birmingham, England

Filed Dec. 4, 1974, Ser. No. 529,276

Claims priority, application United Kingdom, Dec. 8, 1973, 57012/73

Int. Cl.² H02J 7/14

U.S. Cl. 320—48 **4 Claims**



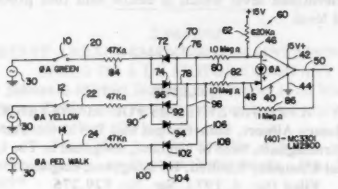
1. A battery charging system for a road vehicle comprising in combination an alternator and associated rectifier providing power to first and second supply lines between which the vehicle battery is connected, the alternator also providing power to a third supply line which in use will be at substantially the same potential at the first supply line, an ignition coupling the third and first supply lines, and voltage sensitive means connected between the third and second supply lines for giving a warning if the potential on the third supply line exceeds a predetermined value, said voltage sensitive means comprising a p-n-p transistor having its emitter connected, (a) to the third supply line by a zener diode which has its anode connected to the emitter of said p-n-p transistor, and (b) to the second supply line by a resistor whereby a predetermined potential difference is established between the emitter of said transistor and the third supply line, a resistance chain connected between the second and third supply lines and providing a base voltage for the p-n-p transistor such that the latter does not conduct when the voltage between the second and third supply lines is normal, but conducts when the potential on said third supply line exceeds said predetermined valve, and means connected to the collector of said p-n-p transistor for energizing a warning device when said p-n-p transistor conducts.

3,944,906

DETECTOR DEVICE FOR CONVERTING A.C. INPUTS TO AN D.C. OUTPUT AND A SYSTEM FOR USING THE SAME

Frank W. Hill, Moline, Ill., and Theodore A. Hedman, Fort Collins, Colo., assignors to Gulf & Western Industries, Inc., New York, N.Y.

Filed Oct. 7, 1974, Ser. No. 512,571
Int. Cl.² H02M 7/00
U.S. Cl. 321—8 R 10 Claims



1. An input detection circuit to provide a D.C. output signal of a selected value upon receipt of an input A.C. signal above a given value of an input line, said detection circuit including a current responsive operational amplifier having an inverted input terminal, a non-inverted input terminal and an output terminal with the output terminal assuming said selected D.C. output value at all times except when the current applied to the inverted terminal is greater than the current applied to the non-inverted terminal, a biasing current supply means connected to said inverted terminal to provide a first biasing current normally exceeding the current at said non-inverted terminal whereby no D.C. output signal substantially as great as said selected value is created at said output terminal; a first input subcircuit including a first unidirectional current device and a first resistor and having a first end connected to said input line and a second end connected to said inverted terminal, said unidirectional device being poled to allow current flow from said biasing current supply means when said input line has a voltage below said biasing current supply means; a second input subcircuit including a second unidirectional current device poled opposite to said first unidirectional device and a second resistor and having a first end connected to said input line and a second end connected to said non-inverted terminal; a second input line and a third unidirectional current device poled in the same direction as said first unidirectional device and connected at one end between said first unidirectional device and said first resistor and at the other end to said second input line and a fourth unidirectional current device poled in the same direction as said second unidirectional device and connected at one end between said second unidirectional device and said second resistor and at the other end to said second input lines whereby an A.C. signal above a given value on either of said first and second input lines will create said D.C. output signal.

3,944,907

ZERO DEADBAND FOUR-QUADRANT FULL-WAVE CONVERTER

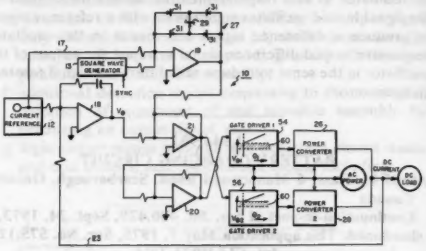
James G. Weit, Pittsburgh, and Charles W. Newcamp, Lower Burrell, both of Pa., assignors to Control Systems Research, Inc., Pittsburgh, Pa.

Filed Sept. 9, 1974, Ser. No. 504,074
Int. Cl.² H02M 1/18
U.S. Cl. 321—13 19 Claims

1. An improved four-quadrant converter comprising:

four-quadrant full-wave static converter means for transferring power between a direct current load and an alternating current supply comprising a first plurality of triggerable devices which when triggered permit positive current flow and a second plurality of triggerable devices which when triggered permit negative current flow;

firing angle selecting means connected to said four-quadrant full-wave static converter means for selecting the firing angle and the appropriate polarity triggerable devices in accordance with the magnitude and polarity of a direct current input signal; and



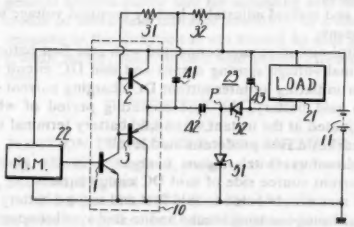
alternating current signal means connected to said firing angle selecting means for imposing an alternating current signal, whose frequency is a function of line frequency and whose phase position is selected so polarity changes occur in proximity to a firing angle zero, on the direct current input signal.

3,944,908

VOLTAGE CONVERTER

Ryuji Oki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 7, 1975, Ser. No. 547,778
Claims priority, application Japan, Feb. 14, 1974, 49-18024
Int. Cl.² H02M 7/00
U.S. Cl. 321—15 4 Claims



1. A transformer-less voltage converter for use with a DC voltage source having positive and negative terminals comprising:

at least one series circuit including a capacitor and a diode;

means for connecting the diode end of said series circuit with said negative terminal of the DC voltage source;

peak-value rectifying means including a capacitor and a diode connected between the connection point between said capacitor and said diode in said series circuit and said positive terminal of the DC voltage source;

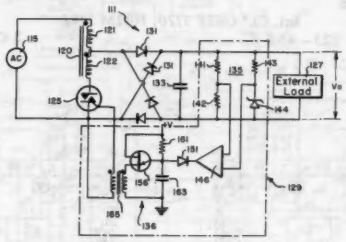
a load connected in parallel with said capacitor of said peak-value rectifying means; and

switching means coupled to said series circuit and operative for connecting the capacitor end of said series circuit alternately with said positive and negative terminals of the DC voltage source, said switching means including a pair of transistors connected in complementary manner and in series with each other between said positive and negative terminals of the DC voltage source and being alternately energized by oscillating means, said capacitor end of the series circuit being connected to the junction formed by said series connected transistors.

3,944,909
VOLTAGE, CURRENT, OR POWER CONTROLLER UTILIZING A SWITCHED REACTANCE A.C. SHUNT REGULATOR

Welles K. Reymond, 131 Danbury Road, Wilton, Conn. 06897

Filed June 11, 1973, Ser. No. 369,083
Int. Cl.² G05F 7/00
U.S. Cl. 323—45 18 Claims



1. A controller for regulating the transfer of at least one of voltage, current, and power from an AC line to a load comprising:

a first inductor, a second inductor, and a switch connected in series and shunting the AC line, said first and second inductors being additively magnetically coupled and said switch providing essentially an open circuit when open and a short circuit when closed;

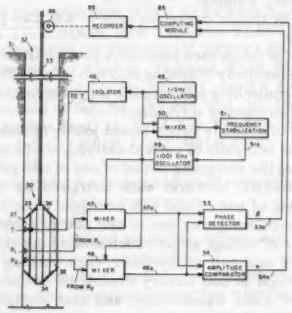
an output connected in parallel across said second inductor and switch, said switch preventing the flow of current in said second inductor when open and providing for the flow of current through said second inductor when closed so that at least one of the voltage, current or power available at the output is reduced when said switch is closed; and

means responsive to a parameter related to at least one of the voltage, current and power available at said output for operating said switch when the monitored parameter reaches a predetermined level.

3,944,910
METHOD AND APPARATUS UTILIZING MICROWAVE ELECTROMAGNETIC ENERGY FOR INVESTIGATING EARTH FORMATIONS

Rama N. Rau, Danbury, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Aug. 23, 1973, Ser. No. 390,987
Int. Cl.² G01V 3/12, 3/18
U.S. Cl. 324—6 23 Claims



1. Apparatus for investigating earth formations surrounding a borehole to obtain an indication of the dielectric constant of the formations, comprising:

a. a member adapted for engagement with the borehole wall;

b. means mounted in said member for injecting microwave electromagnetic energy into the surrounding formations;

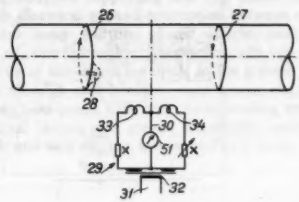
c. first and second receiving antennas mounted in spaced relation on the wall-engaging face of said member for receiving said microwave electromagnetic energy; and

d. means coupled to said antennas for measuring the velocity of propagation of the microwave electromagnetic energy received at said first and second antennas, said velocity being indicative of the dielectric constant of the formations surrounding the first and second antennas.

3,944,911
APPARATUS FOR MAGNETICALLY DETECTING FAULTS IN METAL BODIES UTILIZING A MULTIPHASE GENERATOR TO GENERATE A ROTATING FIELD IN THE BODY

Bengt Hj. Törnblom, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed June 18, 1974, Ser. No. 480,424
Claims priority, application Sweden, June 21, 1973, 7308786
Int. Cl.² G01R 33/12
U.S. Cl. 324—37 1 Claim



1. Apparatus for testing metal bodies comprising:

a. a first y-connected multi-phase generator;

b. a first plurality of y-connected transducer coils comprising at least one coil per phase of the multi-phase generator arranged symmetrically relative to a metal body to be tested, said coils coupled to the phase outputs of said generator such as to induce a moving field in said body when fed with a multi-phase current therefrom; and

c. a second plurality of y-connected transducer coils comprising at least one coil per phase of the multi-phase generator arranged symmetrical relative to said metal body to be tested, said coils coupled to the phase outputs of said generator such as to induce a moving field in said body whose direction is opposite to that of the moving field generated by said first plurality of y-connected transducer coils when fed with a multi-phase current from said multi-phase generator, said second plurality of y-connected transducer coils being located at a section of said metal body different from the section where said first plurality of y-connected transducer coils are located; and

d. means to detect variations in the electrical field generated by said transducer coils which occur when faults and irregularities in the body being tested are encountered comprising

1. First and second transducer coils located adjacent to said metal body between said first and second pluralities of transducer coils and connected in series;

2. a transformer having first and second secondary windings in series and a single primary winding;

3. first and second impedances coupling said first and second transducer coils in series to said first and second secondary windings in series;

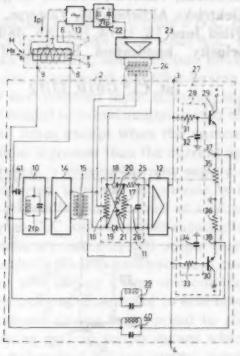
4. means to detect an unbalance between the point at which said first and second transducer coils are connected in series and the point at which said first and second secondaries are connected in series; and
5. means to induce a voltage on the primary of said transformer.

3,944,912

MAGNETIC DETECTION MEANS FOR SENSING MOBILE FERROMAGNETIC MASSES INCLUDING PULSE SHAPER CIRCUIT FOR GENERATING A SINGLE PULSE OUTPUT

Yves Angel, Sceaux, and Duc Mai Van Duc, Saint-Denis, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 11, 1973, Ser. No. 322,632
Claims priority, application France, Feb. 4, 1972, 72.03787
Int. Cl.² G01R *33/00, 33/12*
U.S. Cl. 324—41 **14 Claims**



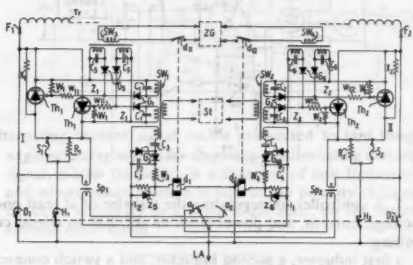
1. A device for detecting mobile ferromagnetic masses along a path exposed to a permanent magnetic field comprising, a pick-up element for producing a signal indicating the local variations of said permanent magnetic field caused by the passage of said ferromagnetic masses, said pick-up element including an element which is made of a ferromagnetic material and which is provided with a pump winding and with a signal winding positioned orthogonal to the pump winding, means for supplying a current of a frequency f_p to the pump winding so as to saturate the ferromagnetic material, a device for processing the signal supplied by the signal winding of the pick-up element comprising a cascade connection of a circuit for selecting an even harmonic of the frequency f_p and a synchronous detector which provides a time varying output signal during passage of a ferromagnetic mass that constitutes the output signal of the processing device, a pulseshaper circuit responsive to said output signal for deriving a single pulse at its output upon the passage of each ferromagnetic mass, and a negative feedback circuit for coupling the output signal of the processing device to a solenoid winding of the pick-up element, and wherein the pulseshaper circuit includes phase-shifter means responsive to the output signal received from the synchronous detector for deriving at first and second terminals first and second voltages in phase opposition, first and second threshold level discriminators having first and second inputs coupled to said first and second terminals, respectively, each of said discriminators deriving at its output terminal voltage pulses of the same polarity but phase shifted relative to one another, and means for combining the voltage pulses at the output terminals of said first and second discriminators.

3,944,913

SYSTEM FOR EFFECTING TAP CHANGES OF TAPPED TRANSFORMER WINDINGS BY MEANS OF THYRISTORS

Kurt Kugler, Lappersdorf, Germany, assignor to Maschinenfabrik Reinhausen Gebruder Scheubeck K. G., Regensburg, Germany

Filed May 19, 1975, Ser. No. 579,115
Claims priority, application Germany, June 1, 1974, 2426638
Int. Cl.² G05F *1/20;* **H02M** *5/12*
U.S. Cl. 323—43.5 S **2 Claims**



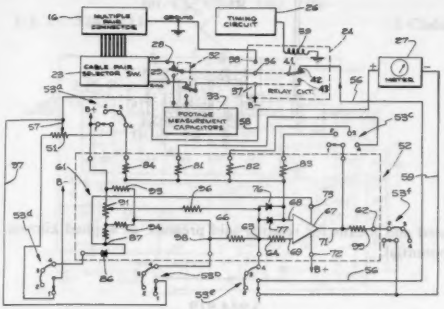
1. Tap-changing means for transformers having thyristors for effecting tap-changes including in combination

a. tapped transformer winding means having a pair of taps;
b. a load-current-carrying line;
c. transfer switch means including two pairs of cooperating relatively movable current-carrying contacts for selectively connecting each of said pair of taps to said line, and two pairs cooperating relatively movable disconnect contacts;
d. two pairs of inverse parallel connected thyristors, each said pairs of thyristors being arranged to shunt one pair of said two pairs of current-carrying contacts in the closed position of one pair of said two pairs of disconnect contacts;
e. a pair of current-limiting resistors each shunted by an electric fuse, each of said pair of current-limiting resistors and the shunting fuse thereof being arranged in series with one of said two pairs of thyristors;
f. means for sequentially triggering said two pairs of thyristors for performing a tap-changing operation, said triggering means including a pair of trigger transformers each for triggering one pair of said two pairs of thyristors, and each of said pair of trigger pulse transformers having a tertiary winding;
g. standby trigger means for each of said two pairs of thyristors;
h. a pair of relays each responsive to a failure of said means for sequentially triggering said two pairs of thyristors and each controlling said standby triggering means of one of said two pairs of thyristors;
i. a pair of auxiliary switch means jointly operated with one of said two pairs of current-carrying contacts, each controlling the energizing circuit of one of said pair of relays;
j. two electric networks each energized by said tertiary winding of one of said pair of trigger pulse transformers and each energizing one of said pair of relays; and
k. a pair of voltage sensors each sensing the voltage across one of said pair of thyristors, each bucking the voltage generated in said tertiary winding of one of said pair of trigger pulse transformers, and each energizing one of said pair of relays in the absence of an emf being generated in said tertiary winding in one of said pair of trigger pulse transformers.

3,944,914
FAULT DETECTION METHOD AND APPARATUS FOR MULTICONDUCTOR CABLES

James F. Simmonds, Canoga Park, Calif., assignor to Perkins Research and Manufacturing Co., Canoga Park, Calif.

Filed Apr. 29, 1974, Ser. No. 464,933
Int. Cl.² G01R 31/02, 31/08; H04B 3/46
U.S. Cl. 324—51 7 Claims



1. An apparatus for detecting the existence of physical faults such as shorts, grounds, opens, crosses, splits, and punchbacks in a multiconductor cable having paired conductors exhibiting distributed capacitance, comprising:

connector means for electrically connecting a plurality of pairs of conductors of said cable to said apparatus;

switching means coupled to said connector means for sequentially selecting each said pair of conductors;

a test circuit coupled to said switching means for testing the selected pair of conductors, said test circuit including means coupled to the selected pair of conductors for periodically electrically charging and discharging the distributed capacitance associated with said selected pair of conductors and means coupled to said means for periodically charging and discharging the distributed capacitance for selectively amplifying the periodically applied charge in accordance with the length of the cable under test; and

said test circuit further including meter means coupled to said means for selectively amplifying the periodically applied charge for registering an average level of magnitude of charge on said pair of conductors wherein such average level is greater than zero charge and less than the peak value of charge assumed by the distributed capacitance of the cable pair, whereby meter readings for each of the plurality of pairs of conductors provides an indication of the existence and type of aforesaid fault.

3,944,915
TEST CONNECTOR WITH ELECTRICALLY CONDUCTIVE HOOK FOR TESTING ELECTRICAL CIRCUITS OF HIGHWAY VEHICLES

Everett R. Yonce, 464 42nd St., Oakland, Calif. 94609

Continuation-in-part of Ser. No. 349,261, April 9, 1973, which is a continuation of Ser. No. 192,445, Oct. 26, 1971. This application Sept. 11, 1974, Ser. No. 505,168
Int. Cl.² G01R 31/02; H01R 3/06
U.S. Cl. 324—51 6 Claims

1. A test connector for testing electrical circuits of highway tractor and trailer vehicles, comprising:

a. an elongated body;

b. a transverse bulkhead extending across said body and being electrically non-conductive;

c. a plurality of contacts mounted in said transverse bulkhead for making electrical connection with the electrical circuits;

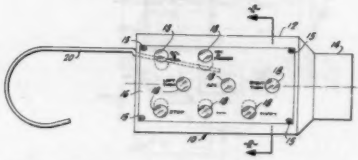
d. a plurality of electrical lamps, each provided with a first and second terminal and being supported by said body such that illumination of each lamp provides visual indications of voltage being applied to an associated electrical circuit;

e. means for electrically connecting each of said first terminals of said electric lamps with each of said corresponding contacts;

f. an electrically conductive hook;

g. means for electrically connecting said hook to each of said second terminals of said electric lamps; and

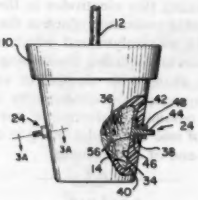
h. an indicator panel transmitting the illumination of each lamp to the exterior of said elongated body and positioned in overlying relation to said lamps, said hook connected with said body, having a portion thereof extending from said body for supporting said test connector, and making an electrical ground connection between each of said electric lamps and one of said vehicles such that a plurality of complete test connector circuits connecting such electrical circuits of a vehicle to the ground can be provided through said contacts, said means electrically connecting said lamps with said corresponding contacts, said electric lamps, said means electrically connecting said hook and said electric lamps, and said hook.



3,944,916
MOISTURE INDICATING PLANT RECEPTACLE

Thomas Tillander, 1274 Ryder St., Brooklyn, N.Y. 11234

Filed Mar. 29, 1974, Ser. No. 456,230
Int. Cl.³ G01R 27/02
U.S. Cl. 324—65 P 9 Claims

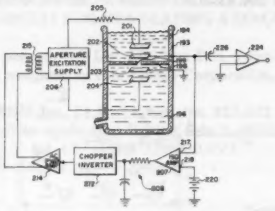


1. A plant receptacle for measuring the moisture content of the soil adapted to be contained therein, comprising two spaced metallic electrodes on the interior wall of said receptacle positioned at a depth in said receptacle commensurate with the normal root level of a plant adapted to be potted in said soil, and metallic terminals on the exterior of said receptacle electrically connected to said electrodes, and means coupled to said metallic terminals for indicating the moisture content of said soil at said root level of said plant.

3,944,917
ELECTRICAL SENSING CIRCUITRY FOR PARTICLE ANALYZING DEVICE

Hogg, Walter R., Miami Lakes; Gerhard A. Liedholz, Miami, and Wallace H. Coulter, Miami Springs, all of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Aug. 13, 1973, Ser. No. 387,548
Int. Cl.² G01N *27/00, 27/42*; G01R *27/14*
U.S. Cl. 324—71 CP **30 Claims**



1. Electrical sensing circuitry for a particleanalyzing device wherein liquid containing particles is caused to flow through a sensing aperture on either side of which is located a sensing electrode, said circuitry being independent of slow changes in aperture diameter and including constant voltage means coupled to said electrodes for establishing an electric excitation current through said aperture and means coupled to said electrodes for detecting signals generated by particles passing through said aperture, said means for establishing an electric excitation current through said aperture having a low output impedance at D.C.

and said means coupled to said sensing electrodes for detecting signals generated by particles passing through said aperture having a low input impedance at the frequencies of the particle-generated signals, said circuitry including circuit means for coupling said signal-detecting means, said electrical excitation current establishing means, and the voltage potential across said aperture in such a manner that the D.C. component of the excitation current flowing through said aperture is made to vary inversely proportional to slow changes of the steady state resistance of the resistance across said sensing electrodes through said aperture with voltage across said sensing electrodes remaining constant.

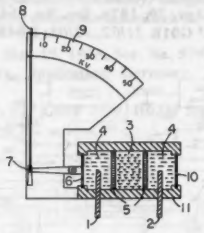
27. In a particle study device wherein a liquid electrolyte containing particles is caused to traverse an electrical sensing zone of small dimensions and wherein said device has a conductivity cell including two electrodes in the electrolyte for establishing a variable resistance which is the function of the conductivity of the electrolyte and which is connected to electrical sensing circuit including the sensing zone to provide compensation for changes in electrolyte conductivity, the improvement comprising said conductivity cell including a long and narrow column of electrolyte between said electrodes with each of said electrodes being in contact with the electrolyte at one end of said column.

3,944,918
ELECTROOSMOTIC KILOVOLTMETER

Albert F. Hadermann, Rte. 1, Ijamsville, Md. 21754; Paul F. Waters, 3318 45th St. NW., Washington, D.C. 20016, and Jung Woo Woo, 2008 N. Adams St., Arlington, Va. 22201

Continuation-in-part of Ser. No. 366,006, June 1, 1973, abandoned. This application July 29, 1974, Ser. No. 492,895
Int. Cl.² G01R *27/22*
U.S. Cl. 324—94 **3 Claims**

1. An electroosmotic kilovoltmeter which comprises in combination a means of generating electroosmotic pressure comprising a polar, powdered or sintered dielectric in contact with a polar or non-polar, non-aqueous dielectric liquid, free from all traces of water, which is its own intrinsic high impedence, means for indicating the electroosmotic pressure gener-

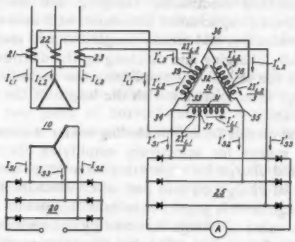


ated and means for relating said pressure as applied kilovolt potential.

3,944,919
DIRECT CURRENT MEASURING SYSTEM FOR RECTIFIERS

James G. Jewell, Bryn Mawr; Fred W. Kelley, Jr., Media, and Charles H. Titus, Newton Square, all of Pa., assignors to General Electric Co., Philadelphia, Pa.

Filed Sept. 26, 1974, Ser. No. 509,509
Int. Cl.² G01R *19/00, 19/18*
U.S. Cl. 324—107 **13 Claims**



1. In a system for measuring the magnitude of direct output current from a multiphase power rectifier having an input circuit including a multiphase power transformer, said power transformer having primary and secondary phase windings connected to provide a phase shift between the multiphase primary and secondary line currents coupled by said power transformer, the combination which comprises line current transformers for measuring each said primary line currents, said line current transformers having secondary windings each connected at one end to a common neutral terminal, a phase shifting current transformer comprising primary and secondary phase windings coupled by separate magnetizable cores in each phase, said cores being designed for normal operation below saturation, means connecting said line current transformer secondary windings to the primary windings of said phase shifting current transformer, said phase shifting transformer providing a primary to secondary winding current phase shift vectorially equal to the current phase shift in said power transformer, a multiphase instrument rectifier connected to the secondary windings of said phase shifting current transformer, and a direct current measuring instrument connected to the output terminals of said instrument rectifier.

3,944,920
CURRENT MEASUREMENT

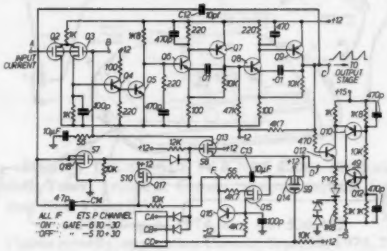
Alan John Borer, Crowborough, England, assignor to Taylor Servomex Limited, Crowborough, England

Continuation of Ser. No. 334,414, Feb. 21, 1973, abandoned. This application Aug. 7, 1974, Ser. No. 495,414

Claims priority, application United Kingdom, Feb. 22, 1972, 8102/72

Int. Cl.² G01R 1/02, 1/00

U.S. Cl. 324—111 **5 Claims**



1. An apparatus responding to the value of a small input current, comprising input terminals for said input current and output terminals, and an integrator, said integrator having an integrator input coupled to said input terminals, and an output, said integrator comprising an amplifier connected in a path between input and output of said integrator and a capacitor, whereby said integrator produces on said capacitor a voltage which is the continuing integral of an input current applied to said input terminals, said apparatus further comprising a differentiator having an input coupled to the integrator output and an output, to differentiate continuously the voltage at the integrator output whilst the voltage at said integrator output is varying, and an output coupled to said output terminals whereby an output is obtained at said output terminals which is directly proportional to said input current, said apparatus further including switching means associated with the input to said integrator, said switching means being of a nature to produce by its operation an unwanted input to said integrator and comprising means for developing a correction signal the effect of which is equal and opposite that of said unwanted signal, and, on operation of said switching means injecting said correction signal into said input.

3,944,921
LOGIC LEVEL TEST PROBE WITH GRATED OSCILLATOR

Shin Tsuda, Hasuda, and Ryozo Hiraga, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 206,286, Dec. 9, 1971, Pat. No. 3,805,155. This application Feb. 13, 1974, Ser. No. 442,044

Claims priority, application Japan, Dec. 11, 1970, 45-110309; Dec. 11, 1970, 45-110310; Dec. 11, 1970, 45-110311; Sept. 28, 1971, 46-75622; May 31, 1971, 46-37625

Int. Cl.² G01R 31/02, 19/16

U.S. Cl. 324—133 **12 Claims**

1. Logic level test equipment comprising:

a probe for sensing electrical signals from a digital circuit under test,

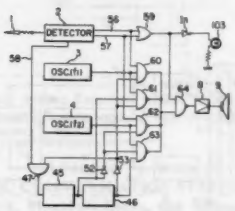
a probe body having a head portion and having said probe mounted at said head portion,

detecting means having an input coupled to said probe for detecting the level of said signals,

illuminating means disposed at said head portion of said probe body for illuminating a desired portion of the digital circuit under test,

control means coupled to said detecting means and responsive to an output therefrom for energizing said illuminating means when said probe is in a non-contact condition with the digital circuit under test, and for deenergizing said illuminating means when said probe contacts the digital circuit,

gate means having a first output, and having first and second inputs, said first input being coupled to said detecting means,



oscillator means connected to said second gate means input for providing an audio signal at said output of said gate means in response to the application of signals from said detecting means to said first input of said gate means, and

electroacoustic transducer means coupled to said gate means output for converting said audio signal into audible signals.

3,944,922
RESISTIVITY MEASURING HEADS

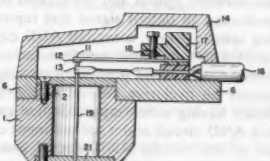
Roger Nicolas Crovo Chambers, and Peter William Amis, both of Newhaven, England, assignors to The Parc-Amber Company Limited, England

Filed Oct. 1, 1974, Ser. No. 511,060

Claims priority, application United Kingdom, Oct. 15, 1973, 48024/73

Int. Cl.² G01R 1/06, 31/02, 27/14

U.S. Cl. 324—158 P **7 Claims**



1. A resistivity measuring head comprising a body portion and a nose portion attachable to and detachable from the body portion, the nose portion having mounted therein a plurality of relatively-short straight probe tips supported parallel to one another for limited axial movement each by means of a pair of spaced jewel bearings fitted into a bore formed in the nose portion, one end of each probe tip being arranged to project from the nose portion for contacting a specimen the resistivity of which is to be measured, and the body portion having mounted therein, for each probe tip, a relatively long spring loaded pin capable of limited axial movement in the

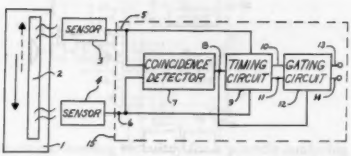
general direction of the axial extent of the probe tips and arranged so that, with the nose portion attached to the body portion, one end of each pin bears upon one end of the respective probe tip so as to apply thereto a spring bias.

3,944,923

DEVICE FOR SENSING THE DIRECTION OF MOTION

Frank Kenneth Luteran, 10 Charles St., Auburn, N.Y. 13021

Filed May 22, 1974, Ser. No. 472,280
Int. Cl.[2] G01P 3/52, 3/36
U.S. Cl. 324—165 6 Claims



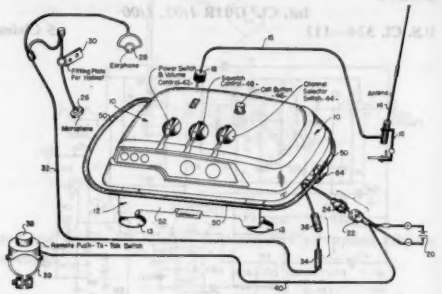
1. A motion detection apparatus comprising;
a. a moving member having a discontinuity,
b. a first sensor positioned to detect the discontinuity and producing a first detection signal,
c. a second sensor positioned to detect the discontinuity producing a second detection system and spaced from the first sensor a distance that will enable the first and second sensors to simultaneously detect the discontinuity during a portion of their separate detections,
d. means for logically determining from the first and second detection signals the relative direction of motion of the moving member, the logic means having circuits that determine the direction of motion by determining which sensor detection occurs prior to the simultanwous detections, the circuits composed at a first Schmitt circuit responsive to the detection signal of the first sensor and producing a first non-inverted and a first inverted output signal, a second Schmitt circuit responsive to the detection signal level of the second sensor and producing a second non-inverted and a second inverted output signal, a first AND circuit having inputs coupled to the first non-inverted output and the second inverted output and producing an output signal that represents an exclusive first sensor output, a second AND circuit having inputs coupled to the second non-inverted output and the first inverted output and producing an output signal that represents an exclusive second sensor output, a flip flop cirucit having a first input coupled to the output of the first AND circuit and a second input coupled to the output of the second AND circuit and producing a first enable output signal for the time period between the first and second input signals and producing a second enable output signal for the time between the second and first input signals, a third AND circuit having inputs coupled to; the first enable output of the flip flop, the first non-inverted output of the first Schmitt circuit and the second non-inverted output of the second Schmitt circuit and producing a first directional output whenever the first sensor output occurs prior to simultaneous detection by both sensors, a fourth AND circuit having inputs coupled to; the second enable output of the flip flop, the first non-inverted output of the first Schmitt circuit and the second non-inverted output of the second Schmitt circuit and producing a second directional output whenever the second sensor output occurs prior to simultaneous detection by both sensors.

3,944,924

CITIZENS BAND TRANSCEIVER ASSEMBLY FOR MOUNTING ON A MOTORCYCLE

Tatsuro Miyachi, Los Angeles, Calif., assignor to Beltek Corporation, Gardena, Calif.

Filed Aug. 5, 1974, Ser. No. 494,506
Int. Cl.[2] H01B 1/38
U.S. Cl. 325—16 2 Claims



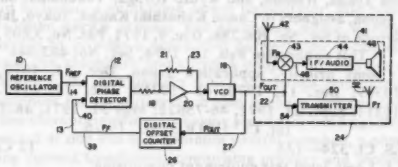
1. An assembly to be mounted on the gasoline tank, or the like, of a motorcycle, or similar vehicle, said assembly including: a transceiver unit; a bracket including a base defining two sides spaced and essentially parallel to one another, a peripheral rod-like member attached to and surrounding said base and configured to define a rectangular area, a plurality of inwardly-extending lug members mounted on said base for supporting the transceiver unit, and vacuum cups mounted on the underside of the base for securing the assembly to the top of the gasoline tank; and means mounted on said transceiver unit for detachably mounting the unit on the base, said means comprising a hook mounted at one end of the transceiver unit and a slidable lock member mounted on the underside of the transceiver unit at the other end thereof and movable between a locked and an unlocked position, said rod-like member receiving the hook to attach the transceiver to the bracket, and the slidable lock member having side ears positioned to clamp the transceiver unit to the lugs when the lock member is in its locked position.

3,944,925

PHASE-LOCKED LOOP TRANSCEIVER HAVING AUTOMATIC FREQUENCY OFFSET SELECTABILITY

Jon M. De Laune, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Aug. 5, 1974, Ser. No. 494,782
Int. Cl.[2] H04B 1/40
U.S. Cl. 325—17 8 Claims



1. A phase-locked loop system for generating an output signal F_{OUT} from any first predetermined frequency varying signal N and any second frequency varying signal M offset from said first predetermined frequency varying signal a predetermined amount in response to a reference signal F_{REF} comprising:
a. a phase-locked loop means having a feed forward path including a phase detector and a voltage controlled oscillator and a feedback path coupled between a first input terminal means and an output terminal means and being

responsive to the signal F_{REF} for generating the signal F_{OUT} at said output terminal;

b. said phase-locked means further including counter means coupled between said input and said output terminals in said feedback path;

c. said counter means including means for programming a selective digital representation of N and means for generating the offset digital frequency M and storing a digital frequency representation $N \pm M$ said counter being responsive to F_{OUT} and said digital representation $N \pm M$ for generating F_F, where F_F is

$$\frac{F_{OUT}}{N \pm M}$$

3,944,926

TIMING TECHNIQUE FOR NRZ DATA SIGNALS

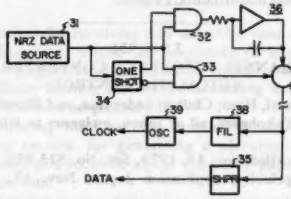
Kamilo Feher, Brossard, Canada, assignor to RCA Corporation, New York, N.Y.

Filed Dec. 6, 1974, Ser. No. 530,402

Claims priority, application Canada, Sept. 30, 1974, 210327

Int. Cl.² H04B 1/00

U.S. Cl. 325—38 R **1 Claim**



1. The combination comprising:

means for generating non-return-to-zero binary information signals;

means for modifying said signals to have rise times differing from fall times including

signal output means,

signal integrating means for producing an integrated signal to said signal output means,

timing means responsive to said binary information signals for producing a timing signal having a duration less than each bit of said binary information signals, and

gating means responsive to said timing signal for applying said binary information signals to said signal integrating means during the timing signal duration and otherwise to said signal output means; and

means for transmitting said signals from said signal output means to a receiving means.

3,944,927

DIGITAL TRANSMISSION SYSTEM

Adolf Reindl, Wayside, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

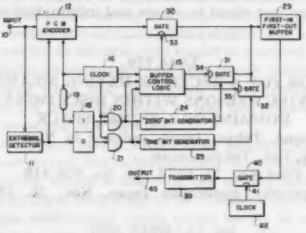
Filed Sept. 1, 1971, Ser. No. 177,034

The portion of the term of this patent subsequent to Feb. 29, 1989, has been disclaimed.

Int. Cl.² H04B 1/04

U.S. Cl. 325—38 A **5 Claims**

4. The method of transmitting in digital format the extremal points of an analog wave comprising: encoding each of said extremal points into a digital word having a predetermined number of digital elements; determining the rate of occurrence of said extremal points; and transmitting a variable number of the most significant binary elements of said digital



words in accordance with a function which varies inversely with respect to said rate of occurrence of said extremal points.

3,944,928

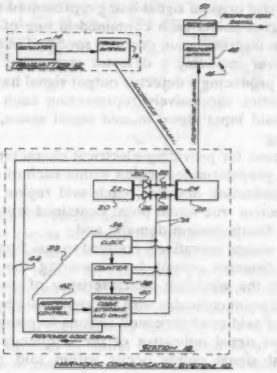
HARMONIC COMMUNICATION SYSTEM

Harry A. Augenblick, Mountain Lakes, and Richard Keller, Livingston, both of N.J., assignors to Microlab/FXR, Livingston, N.J.

Filed July 1, 1974, Ser. No. 484,766

Int. Cl.² H04B 1/10

U.S. Cl. 325—65 **35 Claims**



1. A communication system comprising transmitting means for transmitting a signal having a preselected frequency; a remote station comprising:

station receiving means for detecting said transmitted signal,

information means for generating an information signal,

power means connected to said station receiving means for producing a power signal from said detected signal to energize said information means, said power means comprising only a first two-terminal diode network comprising only semi-conductor diode means polarized in a single direction for conducting current in only one direction from one to the other of said two terminals of said first network.

response signal generating means connected to said station receiving means for producing a harmonic signal of said transmitted signal and for modulating said harmonic signal with said information signal to produce a response signal, said response signal generating means comprising only a second two-terminal diode network comprising only semiconductor diode means polarized in a single direction for conducting current in only one direction

from one to the other of said two terminals of said second network.

and radiating means for radiating said response signal;

and a receiving station comprising means for demodulating said response signal to obtain said information signal.

3,944,929

MONITOR FOR A RECEIVER HAVING MEANS FOR SPECIFYING REGIONS WITHIN DISCRIMINATION DOMAINS OF A SIGNAL SPACE

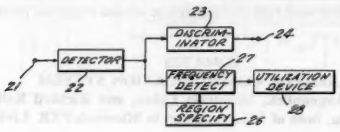
Yoshio Matsuo, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Nov. 22, 1974, Ser. No. 526,418

Claims priority, application Japan, Nov. 26, 1973, 48-132854

Int. Cl.² H04B 1/06

U.S. Cl. 325—363 5 Claims



1. A monitor for a receiver reproducing an original signal from an input signal sent to said receiver through transmission facilities, said original signal being represented by a sequence of true signal points each contained in one of a plurality of contiguous discrimination domains specified in a signal space, said receiver including a detector responsive to said input signal for producing a detector output signal having electrical characteristics successively representing each actual signal point of said input signal in said signal space, said monitor comprising:

first means for providing electrical characteristics specifying a predetermined region within each of the respective discrimination domains, each said region including the respective true signal point contained within the associated discrimination domain; and

second means operatively coupled to said first means and to said detector output for measuring the frequency at which the electrical characteristics of each said actual signal point coincides with the electrical characteristics of any of said predetermined regions to produce a monitor output signal indicative of the frequency at which the actual signal points occur within said predetermined regions.

3,944,930

AUTOMATIC CHANGE-OVER NOTIFICATION FOR A RECEIVER

Masayasu Kaneko, Tokyo; Syunji Ohshima, Yokohama, and Yasuaki Asanuma, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sept. 23, 1974, Ser. No. 508,687

Claims priority, application Japan, Sept. 22, 1973, 48-107232; Sept. 29, 1973, 48-109648

Int. Cl.² H04B 1/40

U.S. Cl. 325—364 10 Claims

1. A change-over notification system adapted for emitting a tone from a receiver in response to the change-over of an RF carrier signal induced in the receiver from an opposite station, comprising:

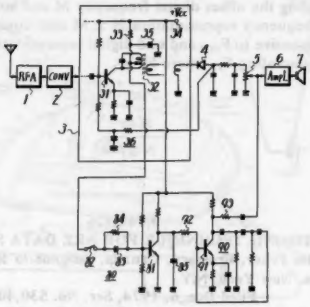
a. a receiver IF amplifier;

b. a receiver detector connected to an output of said IF amplifier;

c. an AGC path from said receiver detector to said IF amplifier for causing an AGC level shift signal in said IF amplifier in response to a presence of the RF carrier signal;

d. a receiver AF amplifier connected to an output of said detector;

e. a change-over detector circuit means connected to said IF amplifier for detecting the change-over of the RF carrier by sensing the IF amplifier AGC level shift signal and for providing an audio oscillator control signal; and



f. an audio oscillator means connected to said change-over detector circuit means and said receiver AF amplifier, said audio oscillator means oscillating in response to said audio oscillator control signal.

3,944,931

MULTI-CHANNEL FREQUENCY CONVERTER HAVING AUTOMATIC CONTROL

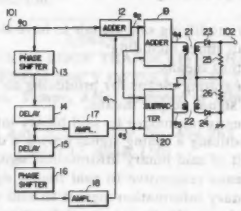
Noboru Usami, Hino; Chuichi Sodeyama, and Hirozi Shoyama, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 14, 1974, Ser. No. 523,852

Claims priority, application Japan, Nov. 17, 1973, 48-129567

Int. Cl.² H04B 1/16

U.S. Cl. 325—423 4 Claims



3. A frequency converter for receiving multichannel broadcast waves and for converting the frequencies of the carriers of said multi-channel broadcast waves, comprising:

means for generating a single local oscillation signal, the frequency of said local oscillation signal being variable by a control voltage fed to said local oscillation signal generating means;

means for mixing said received waves with said local oscillation signal to deliver the corresponding broadcast waves at converted frequencies;

means for simultaneously discriminating a plurality of frequencies, said discriminating means including delay means for delaying an input signal thereto to deliver a first delayed signal, and a second delayed signal, means for adding said input signal to said delay means and said second delayed signal, and means for generating signals representative of a sum of the output of said adding means and said first delayed signal and a difference be-

tween the output of said adding means and said first delayed signal, respectively, and means for rectifying said sum and difference to deliver the corresponding sum and difference signals; and

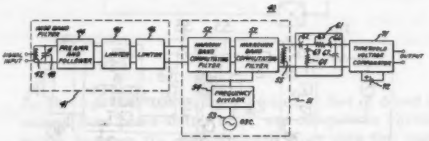
means for supplying said frequency discriminating means with all of said waves frequency-converted by said mixing means and for supplying said local oscillation signal generating means with the output of said frequency discriminating means as a control signal to automatically control the frequency of the output of said local oscillation signal generating means.

3,944,932

RECEIVER FILTERING OUT BOTH SYSTEMATIC PULSE NOISE AND RANDOM NOISE

Kouan Fong, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 5, 1974, Ser. No. 530,128
Int. Cl.² H04B 1/16
U.S. Cl. 325—427 15 Claims



1. A receiver for receiving and detecting tone signals in a noisy environment, where the amplitude of impulse noise exceeds the amplitude of the received signal, comprising:

an amplitude limiting section for excluding noise above a predetermined amplitude;

a commutating filter section coupled to said amplitude limiting section, for generating a plurality of voltages indicative of a received signal within the passband of the filter section;

peak detection means, coupled to said commutating filter, for selecting the one of said voltages having the largest amplitude; and

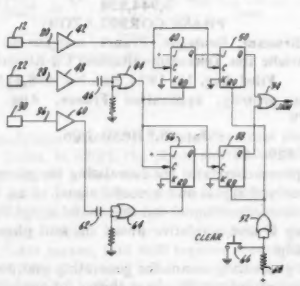
threshold detecting means, coupled to said peak detecting means, for producing an output signal when said selected voltage exceeds a predetermined threshold to indicate the presence of a received tone.

3,944,933

JAM DETECTION CIRCUIT

Jack R. Gallet, Oak Lawn, Ill., assignor to Copar Corporation, Oak Lawn, Ill.

Filed Oct. 7, 1974, Ser. No. 512,431
Int. Cl.² G01N 27/00; G08B 13/16, 21/00
U.S. Cl. 328—5 5 Claims



5. A system for use in detecting jams in a series of members which are sequentially moving through predetermined fixed stations, there being an operation performed on said members in at least one of said stations, said system including detection means at each station providing an output signal indicating the presence or absence of a member at the station,

first circuit means having one input connected to the detection means at a first one of said station, and a reset input connected to the detection means at a second one of said stations, an output for said first circuit means providing a signal when said first circuit means receives a signal from the detection means at said first station indicating the presence of a member,

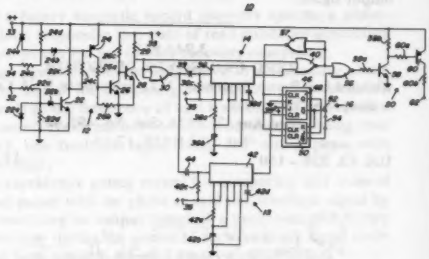
a second circuit means, substantially identical with said first circuit means, and including a first input connected to the detection means at said first one of said stations, and a second input connected to the output of said first circuit means, said second circuit means having an output, providing a signal indicative of a jam condition, when there is a signal at each of its inputs.

3,944,934

FALSE TRIGGERING PREVENTION CIRCUIT

Ralph M. Francis, Jr., Racine, Wis., assignor to Milwaukee Resistor Corporation, Milwaukee, Wis.

Filed Nov. 21, 1974, Ser. No. 526,059
Int. Cl.² H04B 1/03
U.S. Cl. 328—119 11 Claims



1. A pulse circuit comprising:

input circuit means for receiving input pulses;

output circuit means for providing output pulses;

pulse extractor means for extracting a predetermined number of initial ones of said input pulses interconnecting said input circuit means and said output circuit means, said pulse extractor means being nonresponsive to said predetermined number of initial ones of said input pulses applied thereto and responsive to input pulses subsequent to said predetermined number of initial ones of said input pulses for rendering said output means operative to provide output pulses in response to input pulses following said initial ones of said input pulses; and

timing means coupled to said pulse extractor means and to said input circuit means, said timing means being responsive to one of said input pulses for rendering said pulse extractor means operative to extract a number of subsequent input pulses equal in number to said predetermined number upon the elapse of a predetermined time interval following the receipt of said one of said input pulses.

3,944,935

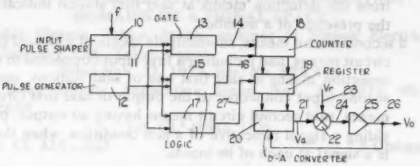
APPARATUS FOR GENERATING A D.C. SIGNAL PROPORTIONAL TO AN INPUT FREQUENCY

Anthony Brian Plant, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Nov. 26, 1974, Ser. No. 527,235
Int. Cl.² H03B 3/04; H03K 5/20
U.S. Cl. 328—140 8 Claims

1. An apparatus for generating a d.c. output signal whose magnitude is proportional to the frequency of an electrical input signal, comprising means for generating a train of sub-

stantially equispaced electrical pulses, a pulse counter, gating means responsive to said input signal for gating said pulses to said counter for a time interval which is dependent on the frequency of said input signal, a digital to analog converter for providing a d.c. signal dependent on the count in said counter at the end of said time interval, a summing junction responsive to said d.c. signal and to an electrical reference signal to generate a control signal proportional to the difference between said d.c. signal and said reference signal, and an integrating circuit responsive to said control signal to generate said output signal, said digital to analog converter also being responsive to said output signal so that said d.c. signal is proportional to the product of said count and said output signal, and a feedback arrangement provided such that variations in said d.c. signal are opposed by corresponding changes in said output signal.



3,944,936

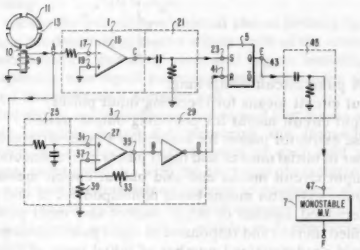
ZERO CROSSOVER DETECTOR

Richard Lee Pryor, Voorhees, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 7, 1974, Ser. No. 495,425

Int. Cl.² H03K 17/16

U.S. Cl. 328—150 **11 Claims**



1. A circuit for distinguishing between zero crossings of interest, which recur over a relatively wide frequency range, of an input signal whose amplitude is inversely related to its width, and which may vary in amplitude and width, which crossings occur when the signal level changes from a relatively high amplitude peak of one sense to a relatively high amplitude peak of opposite sense, and zero crossings not of interest which occur when the signal level changes from a relatively substantially lower amplitude peak of one sense to a relatively lower amplitude peak of the opposite sense, comprising, in combination:

means for directly integrating said input signal for producing an integrated wave having peaks of relatively high and constant amplitude at times corresponding to that at which the zero crossings of interest occur over substantially the entire frequency range within which said zero crossings of interest recur and which is of substantially lower amplitude at other times;

a threshold circuit receptive of said integrated wave for producing an output pulse in response only to each of said peaks of relatively high amplitude;

means responsive to said input signal for producing a signal indication each time a zero crossing of said first signal occurs; and

means responsive to said signal indications and to said output pulses for producing an output signal only when a signal indication occurs concurrently with an output pulse.

3,944,937

BROAD-BAND SIGNAL TRANSMITTING DEVICE USING TRANSFORMER

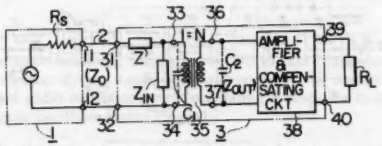
Seiji Fujisawa, Ikoma, and Toru Michioka, Itami, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 3, 1974, Ser. No. 529,101

Claims priority, application Japan, Mar. 15, 1974, 49-30354; Dec. 6, 1973, 48-140398[U]; May 2, 1974, 49-50212[U]; June 6, 1974, 49-65607[U]

Int. Cl.² H04B 1/10

U.S. Cl. 328—167 **9 Claims**



1. A broad-band signal transmitting device including a signal transmitting transformer of a primary-to-secondary turn ratio 1 : N, comprising:

First circuit means for decreasing the gain of signal components applied to the input side of said transmission transformer and for expanding the transmission band of said transmission transformer to a lower frequency;

second circuit means connected with the output side of said transmission transformer and having an impedance sufficiently larger than N^2 times of the characteristic impedance of the input side transmission line of said transmission transformer and smaller than the impedance exhibited by the stray capacitance existing between the output terminals of said transmission transformer at the higher limit of the transmission frequencies;

amplifying circuit means for receiving the signal gain which has been decreased by said first circuit means; and

low frequency compensating circuit means for compensating the lack of low frequency transmission characteristic in said first circuit means and said signal transmitting transformer.

3,944,938

PHASE CORRELATOR

Michel Brouant, Boulogne, France, assignor to Compagnie Industrielle Des Telecommunications Cit-Alcatel, France

Filed Aug. 16, 1974, Ser. No. 498,111

Claims priority, application France, Aug. 16, 1973, 73.29879

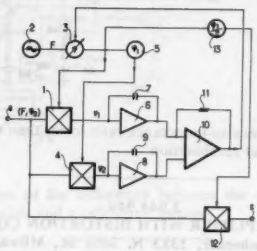
Int. Cl.² H03D 3/06

U.S. Cl. 329—50 **4 Claims**

1. A phase correlator for correlating the phase between a predetermined signal and a useful signal of an input signal, said predetermined signal and said useful signal having a same frequency F and a relative phase ϕ_0, said phase correlator comprising:

signal generating means for generating said predetermined signal, an adjustable phase-shifter for applying an adjustable phase shift ϕ to said predetermined signal, and a fixed phase-shifter for applying a fixed phase $\phi_1/2$ different from zero to said predetermined signal,

control circuit means for controlling the value of ϕ including first and second modulators, said input signal being applied to the input of each of first and second modulators, said first modulator modulating said input signal by said predetermined signal sent out through said adjustable phase-shifter of ϕ, and said second modulator modulating said input signal by said predetermined signal sent



out through both said adjustable phase-shifter of ϕ and a second fixed phase-shifter of ϕ_1, and comparator circuit means between the output signals from said first and second modulators for controlling the value of ϕ, and

modulation means for modulating said input signal by said predetermined signal sent out through said adjustable phase-shifter of ϕ and said fixed phase-shifter of $\phi_1/2$.

3,944,939

DEMODULATOR ASSEMBLY FOR TRAINS WITH DIFFERENTIAL PHASE MODULATION

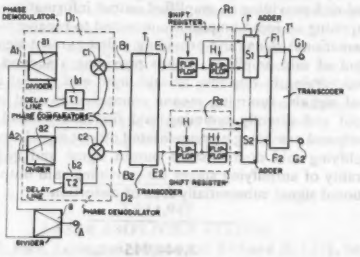
Bernard Le Mouel, La Roche Derrien, France, assignor to Societe Lannionnaise d'Electronique Sle-Citerel, France

Filed Apr. 16, 1974, Ser. No. 461,372

Claims priority, application France, Apr. 16, 1973, 73.13730

Int. Cl.² H03K 9/04

U.S. Cl. 329—104 **5 Claims**



1. A demodulator assembly for m differential phase shift modulation trains, in which the phase shift information concerns bits spaced by n intermediate bits, said assembly comprising: for each train elementary demodulator means for providing bit signals relating to phase differences of adjacent bits, shift register means for receiving respective outputs of said demodulator means, said shift register means being provided with n+1 flip-flops, and adder means connected to said shift register means to receive at n+1 bit informations contained in said n+1 flip-flops for producing a respective one of m demodulated output trains being dephased between bits spaced by n intermediate bits.

3,944,940

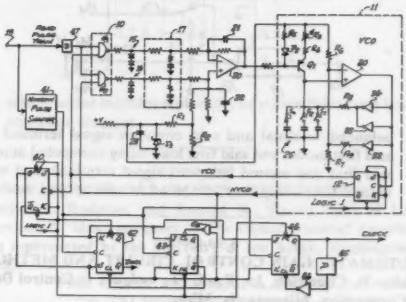
VERSATILE PHASE-LOCKED LOOP FOR READ DATA RECOVERY

Ashok K. Desai, Chatsworth, Calif., assignor to Pertec Corporation, Chatsworth, Calif.

Filed Sept. 6, 1974, Ser. No. 503,864

Int. Cl.² H03D 3/18

U.S. Cl. 329—122 **10 Claims**



1. In a binary magnetic record recovery system, a phase-locked loop responsive to a train of read pulses for generating reference pulses for use in data recovery comprising:

voltage controlled means responsive to a corrective phase error signal for producing two square wave feedback signals at the frequency of said train of read pulses when a known cyclic pattern of recorded pulses are being read back, one feedback signal being 180° out of phase with the other,

first coincidence gating means for comparing said train of read pulses with the phase of said one feedback signal by transmitting an output signal of a predetermined binary level only during the period of each feedback signal cycle that both are at a selected binary signal level,

second coincidence gating means for comparing said train of data pulses with the phase of said other feedback signal by transmitting an output signal of said predetermined binary level only during the period of each feedback signal cycle that both are at said selected binary signal level,

first and second low pass filter means for separately filtering said output signals of said first and second coincidence gating means, and

differential amplifying means for producing said corrective phase error signal proportional to the difference between output signals of said first and second low pass filtering means connected to a pair of differential input terminals of said amplifier.

3,944,941

SWITCHING CIRCUIT FOR USE WITH BALANCED TRANSFORMERLESS AMPLIFIER

Akira Tsuda, Matsudo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed July 26, 1974, Ser. No. 492,331

Claims priority, application Japan, Aug. 1, 1973, 48-91037[U]

Int. Cl.² H03F 3/68

U.S. Cl. 330—51 **5 Claims**

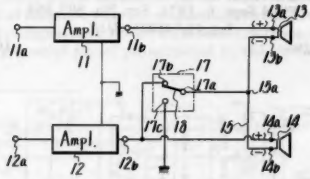
1. An amplifier output circuit comprising

A. first and second balanced signal terminals and a common signal terminal;

B. first and second loads;

C. switching means connected to said second balaced signal terminal and to said first and second loads to switch said output circuit selectively to a first or a second operating

mode, said first load being connected between said first balanced terminal and said common signal terminal and said second load being connected between said second balanced terminal and said common signal terminal in said first mode, and said first load being connected across said first and second balanced signal terminals and said second load being short circuited in said second mode.

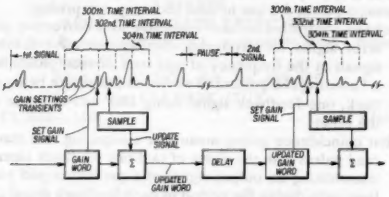


3,944,942

AUTOMATIC GAIN CONTROL CIRCUIT AND METHOD

Walter H. Chudleigh, Jr., Paoli, Pa., assignor to Control Data Corporation, Minneapolis, Minn.

Filed June 26, 1972, Ser. No. 278,479
Int. Cl.² H03G 3/30; G01V 1/28
U.S. Cl. 330—86 16 Claims



6. An automatic gain control circuit comprising:

means including means for generating a plural bit binary gain control signal including an amplifier for receiving a variable amplitude signal of recurring nature;

means for sampling the amplitude of the signal in one occurrence thereof at a pluarlity of temporally spaced time intervals; and,

means for varying the gain of said amplifier for a subsequent occurrence of the signal in each of said plurality of temporally spaced time intervals in response to the sampled amplitude in the corresponding time intervals of the sampled occurrence of said signal, said amplifier including a plurality of amplification stages connected in cascade, each of said amplification stages having a predetermined gain and means for reducing said predetermined gain by a predetermined amount in response to the application of at least one bit of a plural bit digital gain control signal.

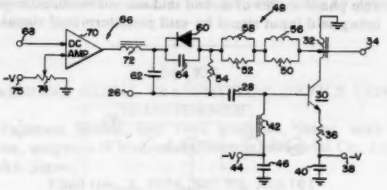
3,944,943

BROADBAND AMPLIFIER

Frederick Frank Reed, El Paso, Tex., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 29, 1974, Ser. No. 528,337
Int. Cl.² H03F 1/36
U.S. Cl. 330—109 12 Claims

1. A broadband amplifier having a negative feedback path from the collector to the base of a transistor including a series connection of a resistive means and a first parallel combination of a first resistor and first inductor for providing the amplifier with a gain approximately proportional to the square root of frequency, the improvement comprising a second parallel combination of a second resistor and a second inductor connected in series with said first parallel combination in said negative feedback path, said second parallel combination having a resistance-to-inductance ratio lower than the ratio of said first parallel combination.

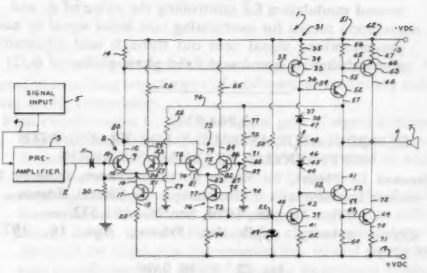


3,944,944

POWER AMPLIFIER WITH DISTORTION CONTROL

Daniel G. Ellenbecker, 2323 N. 38th St., Milwaukee, Wis. 53210

Filed Oct. 24, 1974, Ser. No. 517,451
Int. Cl.² H03F 1/26
U.S. Cl. 330—149 11 Claims



4. A power amplifier for receiving an input informational signal and providing an amplified output informational signal, comprising an input amplifier connected to receive said input informational signal and providing a first current signal at an output of said amplifier, means providing a second current signal varying in response to said input and output informational signals, summing means connected to said amplifier output and directly summing said first and second current signals and providing a compensated output signal, and means amplifying said compensated output signal and including a plurality of amplifying stages for providing said output informational signal substantially free of distortion.

3,944,945

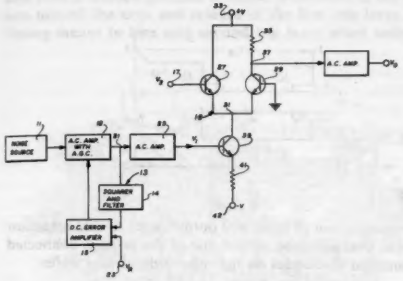
NOISE GENERATOR SYSTEM HAVING AMPLITUDE CONTROL

Ernesto Corte, La Jolla, Calif.; Pradeep Maitra, New Delhi, India, and Wesley Donald Franklin, San Diego, Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Nov. 25, 1974, Ser. No. 526,595
Int. Cl.² H03B 29/00
U.S. Cl. 331—78 6 Claims

1. A noise generator system comprising, a noise source, amplifier means including automatic gain control means responsive to an applied voltage, means for applying the output of said noise source to the input of said amplifier means, and a feed back loop coupled between the output of said amplifier

means and the input of said automatic gain control means, said feed back loop including means for producing a voltage



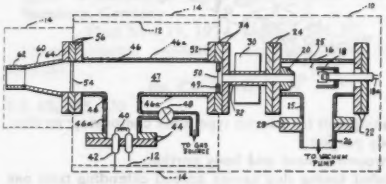
representative of the difference between the output of said amplifier means and a reference voltage.

3,944,946

COHERENT GENERATION OF MICROWAVES BY STIMULATED RAMAN EMISSIONS

Balram Prasad, 56 William St., West Newton, Mass. 02165, and Clare C. Leiby, Jr., 229 Oil Billerica Road, Bedford, Mass. 01730

Filed Nov. 15, 1974, Ser. No. 524,170
Int. Cl.² H03B *17/00*
U.S. Cl. 331—94 **4 Claims**



1. A method of generating controlled, coherent microwave radiation from a warm, uniform plasma at approximately twice the plasma frequency comprising the steps of

directing high energy electrons into a plasma to excite longitudinal electrostatic waves in the plasma such that the energy density level of the said waves is sufficient to stimulate transverse electromagnetic wave radiation at approximately twice the plasma frequency and

coupling said electromagnetic energy for use in appropriate circuitry.

3,944,947

LASER AMPLIFIER SYSTEM

Charles T. Pike, Lexington, Mass., and Richard H. Levy, Seattle, Wash., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Nov. 1, 1974, Ser. No. 520,047
Int. Cl.² H01S *3/02*
U.S. Cl. 331—94.5 D **21 Claims**

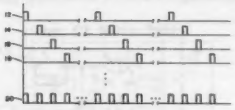
1. A laser amplifier system comprising:

a laser oscillator stabilized in frequency of radiation output;

a plurality of laser amplifier channels;

means for distributing laser radiation from said laser oscillator to each of said plurality of laser amplifier channels in parallel; and

means for sequential pulse activation of each of the laser amplifier channels, said sequential pulse activation means including means for providing repeated sequential activation, thereby resulting in a series of laser output pulses,



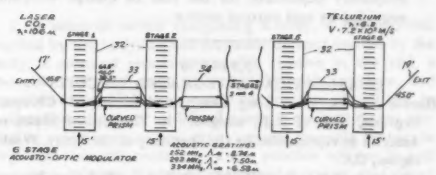
which series includes a plurality of pulses from each laser amplifier channel.

3,944,948

CASCADED DATA MODULATION SYSTEM

Charles M. Redman, and Ronald W. Moore, both of Las Cruces, N. Mex., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 22, 1974, Ser. No. 516,938
Int. Cl.² H04B *9/10*; **G02F** *1/28*
U.S. Cl. 332—7.51 **6 Claims**



1. A system for transmitting data over a wide bandwidth comprising an array of a plurality of successive acousto-optic transparent crystals, a high frequency signal source with side bands adapted to contain such data, means to apply the output of said signal source to said crystals in a manner to form acoustic gratings in the crystals, a source of optical radiation providng a coherent optical beam, means to direct said optical beam successively through said array of crystals in a manner to traverse said acoustic gratings, whereby the beam emerges from said array modulated with a bandwidth in accordance with the number of passes of the beam through the acoustic gratings, and means to demodulate the emerging modulated optical beam, wherein said directing means includes a transparent prism in the path of said optical beam, wherein said transparent prism is located between two adjacent crystals of said array in the path of the optical beam, and wherein said prism has at least one curved surface arranged to provide a focusing action on said optical beam.

3,944,949

FREQUENCY MODULATOR

William Frederic Herzog, San Martin, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Nov. 18, 1974, Ser. No. 524,656
Int. Cl.² H03K *9/06*
U.S. Cl. 332—14 **9 Claims**

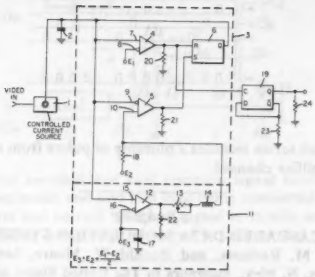
1. A frequency modulator comprising;

a capacitor;

a controlled current source coupled to said capacitor and responsive to an applied modulating signal for varying the charge on it in a first direction at a rate dependent upon said applied modulating signal;

a bistable circuit coupled to said capacitor and responsive to the charge thereon to be switched to each of its two stable states, said current source being coupled to vary

the charge on said capacitor in a first direction when said bistable circuit is in a first of its two stable states, said bistable circuit coupled to vary the charge on said capacitor in a second direction opposite said direction when in a second of its two stable states, said bistable circuit



having a control terminal for controlling the frequency of switching between its stable states; and,

a control means coupled between said capacitor and said control terminal for controlling the stable state switching frequency dependent on the rate of charge variation provided by said current source.

3,944,950

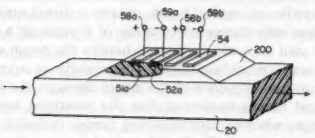
QUASI-OPTICAL INTEGRATED CIRCUITS

Harold Jacobs, West Long Beach, and Metro M. Chrepta, Neptune, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 397,184, Sept. 13, 1973, Pat. No. 3,866,143, and a continuation-in-part of Ser. No. 218,964, Jan. 19, 1972, abandoned. This application Sept. 30, 1974, Ser. No. 510,526

Int. Cl.² H01P *1/18, 1/32, 3/20, 9/00*

U.S. Cl. 333—31 R **19 Claims**



1. In combination, a quasi-optical energy waveguide consisting entirely of a bulk single crystal intrinsic semiconductor waveguiding medium of high resistivity for propagating millimeter and submillimeter wave energy in the fundamental mode, at least one electrical circuit element disposed at a portion of said medium, and wave energy propagation control means including means for supplying a unidirectional forward biasing voltage to said element for controlling the propagation through said medium of said wave energy in response to conductivity variations produced within said portion of said medium.

3,944,951

MONOLITHIC CRYSTAL FILTER

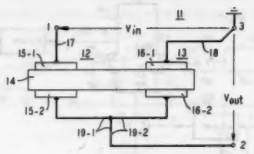
Carl Ferdinand Kurth, Andover, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 21, 1974, Ser. No. 525,885

Int. Cl.² H03H *9/20, 9/26, 9/32*

U.S. Cl. 333—72 **3 Claims**

1. A monolithic crystal filter apparatus including a piezoelectric wafer and a plurality of coupled crystal resonator elements including electrode pairs partially enclosing portions of the piezoelectric wafer, the electrodes on one side of said wafer being conventionally designated as the common termi-



nal for connection of input and output ports to said resonator elements, characterized in that one of the ports is connected only between electrodes on the other side of said wafer.

3,944,952

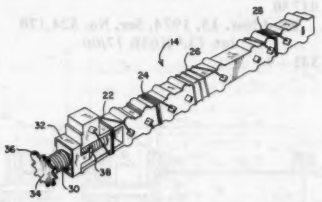
FINE TUNING SYSTEM HAVING A LIMITED USER ADJUSTABLE TUNING RANGE

Joe G. Badger, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed Oct. 24, 1974, Ser. No. 517,460

Int. Cl.² H03J *1/06, 5/10*

U.S. Cl. 334—39 **20 Claims**



1. A tuning unit for a turret type tuner comprising: an elongated body portion;

a coil wound around said body portion;

a threaded tuning slug having an end extending from one end of said body portion, said tuning slug being rotatable with respect to said body portion for adjusting the impedance of said coil; and

a circular gear having a plurality of teeth including a stop tooth affixed to the end of said tuning slug extending from said body portion, wherein said tuning slug is affixed to said gear for rotation therewith upon rotation of said gear, and wherein said tuning slug is rotatable with respect to said gear when said gear is constrained.

3,944,953

CURRENT LIMITING CIRCUIT BREAKER

Clark L. Oster, Cedar Rapids, Iowa, assignor to Square D Company, Park Ridge, Ill.

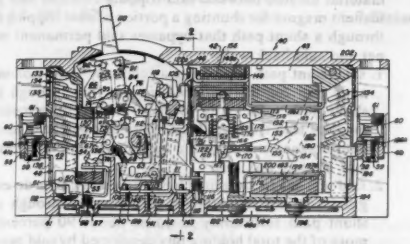
Filed Apr. 29, 1974, Ser. No. 465,399

Int. Cl.² H01H *73/48*

U.S. Cl. 335—23 **2 Claims**

1. An electric circuit breaker comprising a molded case, a pair of separable contacts in the case, a first releasably latchable trip lever pivotally mounted in the case and releasable from a latched position to effect separation of the contacts, first biasing means to bias said first trip lever toward a tripped unlatching position, a magnetic core in the case, an armature pivotally mounted in the case, having a latching position in which it latches the first trip lever in the latched position and is spaced from the magnetic core, second biasing means to bias said armature toward said latched position, said armature being attractable toward the magnetic core upon flow of

excess current through the contacts to release the first trip lever and effect separation of the contacts, a second releasably latchable trip lever pivotally mounted in the case and releasable from a latched position to effect movement of the armature toward the core and release of the first trip lever, third biasing means to bias said second trip lever when unlatched



against said armature for movement in a direction to disengage said armature from said first trip lever, latching means pivotally mounted in the case and having a latching position in which it latches the second trip lever, and a bimetallic member mounted in the case and effective upon flow of sustained moderate overload current through the contacts to pivot the latching means and release the second trip lever.

3,944,954

EXCESS CURRENT SWITCHING DEVICE

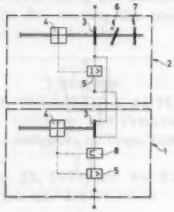
Jakob Ellenberger, Altdorf near Nurnberg, Germany, assignor to Ellenberger & Poensgen GmbH, Altdorf near Nurnberg, Germany

Filed Nov. 19, 1974, Ser. No. 525,311

Claims priority, application Germany, Nov. 23, 1973, 2358382

Int. Cl.² H01H *75/12*

U.S. Cl. 335—35 **7 Claims**



1. An excess current switching device comprising, in combination:

a. a first excess current switch having

i. a first break point, and

ii. at least one tripping device effective to trip said first break point on the occurrence of an excess current,

b. a second excess current switch having

i. a second break point, and

ii. an electromagnetic tripping device effective to trip said second break point on the occurrence of an excess current, said electromagnetic tripping device having a coil of high ohmic design, said electromagnetic tripping device being coupled in parallel with said first break point, whereby when said first break point is tripped, excess current flows through said electromagnetic tripping device to trip sequentially said second break point.

3,944,955

SOLENOID SWITCHES

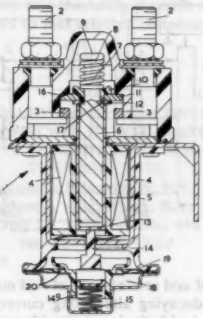
Derek Thornley, Nelson, England, assignor to Lucas Electrical Company Limited, Birmingham, England

Filed July 26, 1973, Ser. No. 382,851

Claims priority, application United Kingdom, July 26, 1972, 34869/72

Int. Cl. H01h *7/03*

U.S. Cl. 335—61 **5 Claims**



1. A solenoid switch comprising a body, a solenoid coil carried by the body, a fixed electrical contact carried by the body, a solenoid armature movable relative to the coil, a movable electrical contact carried by said armature, and movable therewith in response to energisation of said coil, in a direction to engage said fixed contact, resilient means carried by said armature, and acting on said movable contact to urge said movable contact to a rest position relative to said armature, a sleeve slidably receiving said armature, said sleeve being movable relative to said coil with said armature, said sleeve being coupled to said armature by way of said resilient means for movement with the armature in the contact engagement direction, and, a delay unit operatively associated with said sleeve, said delay unit slowing movement of said sleeve in the contact engaging direction, whereby, when said coil is energised, said sleeve and said armature move against the action of the delay unit in the contact engaging direction, and are slowed in their movement by the delay unit, whereas when said movable contact engages said fixed contact said armature moves relative to said sleeve and said movable contact against the action of said resilient means thereby rapidly increasing the contact pressure between said movable contact and said fixed contact.

3,944,956

MAGNETICALLY CONTROLLED SWITCHING MATRIX

Leonid Yakovlevich Misulovin, Riga; Igor Ivanovich Panin, Ogre, Latviiskoi; Yakov Girshevich Soloveichik, Riga; Leonid Anisimovich Kovalev, Riga, and Viktor Olimpievich Zhoglo, Riga, all of U.S.S.R., assignors to Corning Glass Works, Corning, N.Y.

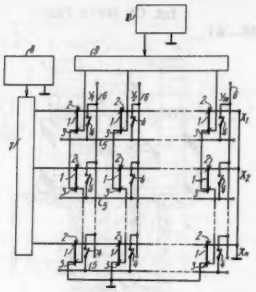
Filed July 31, 1974, Ser. No. 493,731

Int. Cl.² H01H *67/14*

U.S. Cl. 335—112 **7 Claims**

1. A magnetically controlled switching matrix, comprising: a plurality of magnetic members arranged in rows and columns of said switching matrix, each member made from a magnetic material having at least two stable states of magnetization; a first coil of each of said magnetic members placed thereon which induces a magnetic flux in said member and is connected into the electric circuit of said matrix row associated with said magnetic member; a second coil of each of said magnetic members placed thereon which induces a magnetic flux in said member and is connected into the electric circuit of said matrix column associated with said magnetic member;

each said magnetic member magnetically coupled with at least one respective magnetically responsive switch; a row selection circuit having an input and an output electrically connected with all of said first coils of said magnetic members; a column selection circuit having an input and output electrically connected with all of said second coils of said magnetic members; a generator of decaying alternating current pulses with its output connected with the input of said row selection circuit; and a direct current generator with the output thereof connected with the input of said column selection circuit.

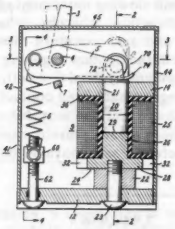


3,944,957

FLUX-TRANSFER TRIP DEVICE FOR A CIRCUIT BREAKER

Peter Kotos, Havertown, and Patrick P. Yen, Philadelphia, both of Pa., assignors to General Electric Company, Plainville, Conn.

Filed Dec. 23, 1974, Ser. No. 535,640
Int. Cl.² H01H 9/20
U.S. Cl. 335—174 **5 Claims**



1. In an electromagnetic trip device,

A. a frame of highly permeable magnetic material comprising a back wall, a front wall, and a pair of spaced side walls extending between said front and back walls;

B. a plunger of highly permeable magnetic material supported for straight line reciprocal movement through a close-fitting hole in said front wall;

C. a permanent magnet of cobalt-rare earth material having a pair of opposed poles one of which is located adjacent said back wall;

D. a pole piece of highly permeable magnetic material located between the other pole of said permanent magnet and said plunger and providing a surface against which said plunger is held in a withdrawn position by holding flux from said permanent magnet passing through the interface between said pole piece and said plunger;

E. a tripping coil supported within said frame and surrounding a portion of said plunger for developing, upon energization, tripping flux passing through said interface that opposes the holding flux from said permanent magnet passing through said interface, thereby effecting release of said plunger from its withdrawn position upon energization of said tripping coil;

F. spring means for moving said plunger out of said withdrawn position upon release of said plunger;

G. flux-diverting structure of highly permeable magnetic material located between said tripping coil and said permanent magnet for shunting a portion of said tripping flux through a shunt path that bypasses said permanent magnet and said back wall;

1. said shunt path containing a relatively large non-magnetic gap for limiting the tripping flux through said shunt path sufficiently to cause about 30 percent or more of said tripping flux to pass through said permanent magnet in a direction opposite to the direction of said holding flux, and

2. said non-magnetic gap acting when said coil is de-energized to limit the holding flux passing through said shunt path sufficiently to cause about 90 percent or more of the total holding flux developed by said permanent magnet to pass through said interface,

H. a shaft;

I. a tripping member mounted on said shaft;

J. a lever also mounted on said shaft and having two spaced-apart ends, one of which is pivotally connected to said plunger and the other of which is connected to said apring means, and

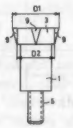
K. means for adjusting the force developed by said spring means while said plunger is held in said withdrawn position.

3,944,958

ADJUSTING PIN FOR A FERRO-MAGNETIC CORE

Willem Johannes Postma, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 17, 1974, Ser. No. 479,902
Claims priority, application Netherlands, June 18, 1973, 7308413
Int. Cl.² H01F 21/06
U.S. Cl. 336—136 **8 Claims**

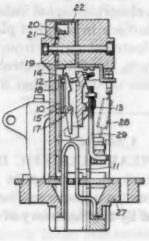


1. An adjusting pin adapted to be axially displaceable in a cylindrical opening recessed in a ferromagnetic core, said adjusting pin comprising a ferromagnetic body secured to a body of synthetic material, the body of synthetic material having a rigid head on one end of the adjusting pin with the largest transverse dimension of the head being smaller than the diameter of the cylindrical opening of the core, a first end portion of the head facing the end of the adjusting pin while the second end portion of the head faces the ferromagnetic body, a plurality of rigid non-deformable longitudinal ridges being formed on said head which taper uniformly over at least a part of their length, the thickest part being situated near the first end portion of the head, the diameter of a circumscribed circle of the head with longitudinal ridges being larger near the first end portion and being smaller near the second end portion than the diameter of the cylindrical opening of the core.

3,944,959
ELECTRICAL CIRCUIT BREAKER

Alan Lister Kidd, Southport, England, assignor to Dorman Smith Switchgear Limited, Preston, England

Filed Sept. 12, 1974, Ser. No. 505,225
Claims priority, application United Kingdom, Oct. 4, 1973, 46290/73
Int. Cl.² H01H 71/16
U.S. Cl. 337—82 7 Claims

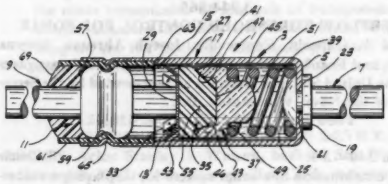


1. In an electrical circuit breaker including a heat responsive bimetal element with a capacity for deflecting upon passage of current through the circuit breaker with the deflection occuring under fault conditions resulting in a displacement by the bimetal element of a movable member having a movement serving to initiate a tripping operation of the circuit breaker, the improvement comprising: an adjustable element for transmitting deflection of the bimetal element to the movable member, the adjustable element including a wedge adjustable for varying the thickness thereof and increasing or decreasing the amount of deflection of the bimetal element for moving the movable element to cause the tripping, a slide for mounting the wedge and being adjustably displaceable in a plane substantially parallel to the plane of the bimetal element, and means for enabling the slide to be displaced manually including a boss eccentrically mounted upon a rotatable knob and located between two confronting thrust surfaces provided at opposite sides of a recess in the slide, the positioning of the wedge increasing or decreasing the amount of deflection of the bimetal elements for moving the movable member to cause tripping of the circuit breaker.

3,944,960
NONRESETTABLE THERMALLY ACTUATED SWITCH

Richard T. Audette, Attleboro, and Frederick G. Perry, Norton, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 29, 1974, Ser. No. 527,979
Int. Cl.² H01H 37/76
U.S. Cl. 337—408 14 Claims

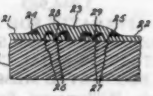


1. A nonresettable thermally actuated switch comprising a case of electrically conductive material, a power lead means electrically insulated from the case, deformable connector means of electrically conductive material in electrical contact with an inside surface of said case and with said lead means thereby to complete a circuit, an electrically insulating member movable for deforming said connector means away from said inside surface of said case and for electrically insulating said connector means from said case thereby to break said circuit, means resiliently biasing said insulating member for movement to deform said connector means away from said inside case surface, and a normally solid body of material fusible at a selected temperature disposed within said case to prevent said insulating member movement while said body is solid and to permit said insulating member movement when said body is heated to said selected temperature.

3,944,961
MECHANICALLY IMPROVED CONTACTS FOR RADIATION SWITCHES HAVING MATERIAL THAT CONVERTS FROM ELECTRICALLY NON-CONDUCTIVE TO CONDUCTIVE

Dominic Anthony Cusano, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed July 22, 1974, Ser. No. 490,585
Int. Cl.² H01H 37/64
U.S. Cl. 337—329 6 Claims



1. A radiation switch comprising:
a substrate;
a pair of conductors on said substrate having a gap therebetween;
a quantity of conductor precursor material overlying and in contact with a portion of each of said conductors; and
means for decreasing the thermal conductivity of said conductors where said conductors are in contact with said conductor precursor material.

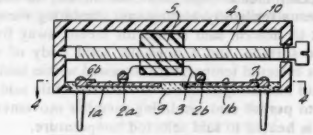
3,944,962
VARIABLE RESISTANCE ATTENUATOR

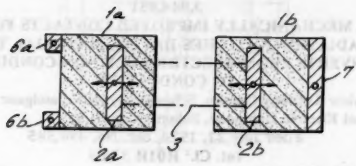
Hisashi Honda, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Aug. 22, 1974, Ser. No. 499,653
Claims priority, application Japan, Aug. 22, 1973, 48-94743
Int. Cl.² H03H 7/26; H01C 13/02, 10/16, 10/22
U.S. Cl. 338—126 11 Claims

1. A variable-resistance attenuator comprising a first resistive layer, a second resistive layer, first and second slidable contacts mechanically and electrically connected to one another and respectively disposed on the sufaces of said first and second resistive layers, input and output terminals provided at one end of said first resistive layer in the sliding direction of said first slidable contact, a common terminal provided at one end of said second resistive layer in the sliding direction of said second slidable contact, and means attached to said first and second slidable contacts for moving said first slidable contact in a first direction relative to said one end of said first resistive layer to vary the amount of electrical attenuation between said input and output terminals and for simultaneously moving said second slidable contact in an opposite

direction relative to said one end of said second resistive layer to maintain the impedance between each of said input and





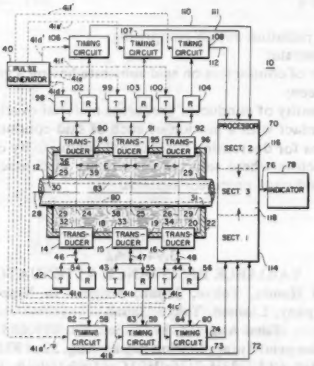
output terminals and said common terminal at a constant value.

3,944,963

METHOD AND APPARATUS FOR ULTRASONICALLY MEASURING DEVIATION FROM STRAIGHTNESS, OR WALL CURVATURE OR AXIAL CURVATURE, OF AN ELONGATED MEMBER

Lee Mizener Hively, Williamsport, Pa., assignor to Western Electric Co., Inc., New York, N.Y.

Filed Aug. 21, 1974, Ser. No. 499,378
Int. Cl.² G01S 9/66; G01N 29/00
U.S. Cl. 340—1 R **10 Claims**



4. A method of measuring the axial curvature of a nominally straight elongated member having a first surface and a second surface, the first and second surfaces being substantially symmetrical about a longitudinal axis; which comprises:

a. positioning the member with respect to three sites spaced at predetermined distances along a line substantially parallel to the longitudinal axis, each site being capable of transmitting and receiving ultrasonic signals along a path substantially normal to the first and second surfaces, the paths and the longitudinal axis lying substantially in a first plane;

b. at each site, transmitting ultrasonic signals to the first and second surfaces and receiving portions of the ultrasonic signals reflected from the first and second surfaces;

c. generating first electrical signals representing the transit times of the portions of the ultrasonic signals reflected from the first surface;

d. generating a second electrical signal from the first electrical signals, the second electrical signal indicating the curvature of the first surface in the first plane;

e. generating third electrical signals representing the transit times of the portions of the ultrasonic signals reflected from the second surface;

f. generating a fourth electrical signal from the third electrical signal, the fourth electrical signal indicating the curvature of the second surface in the first plane; and

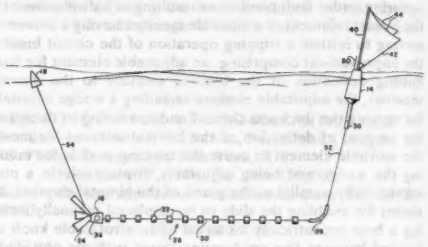
g. generating a fifth electrical signal from the second and fourth electrical signals, the fifth electrical signal indicating the axial curvature of the member in the first plane.

3,944,964

AIR DROPPED LINEAR ACOUSTIC DETECTOR

Harrison T. Loeser, Waterford, and Hamlin A. Caldwell, Jr., Stonington, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 19, 1973, Ser. No. 427,762
Int. Cl.² G01S 3/80; B63C 49/00
U.S. Cl. 340—2 **9 Claims**



1. A linear acoustic detector comprising:

a parachute section;

a main body detachatably connected to said parachute section;

a mast-booms-sails arrangement removably stowed in said main body;

a cable pod connected to said main body;

an array cable removably stowed away in said cable pod;

a plurality of hydrophones connected along the length of said array cable; and

an auxiliary buoy detachably connected to said cable pod.

3,944,965

OVERFLOW THRESHOLD CONTROL FOR SONAR

Edward A. Caporin, Centreville; Joseph Abruzzo, Severna Park, and Frank L. Rees, Ellicott City, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 22, 1965, Ser. No. 428,022
Int. Cl.² G01S 9/66, 7/66
U.S. Cl. 340—3 R **8 Claims**

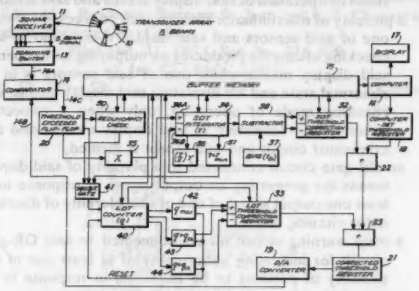
1. In combination in a sonar system for displaying a succession of echo signals received from a target illuminated respectively by a succession of transmitted pulses,

means for generating a base threshold quantity related to background noise,

a comparator for comparing the amplitude of each echo signal with the base threshold,

first means responsive to received signals which pass said comparator for changing said base threshold in predeter-

mined relatively small increments,

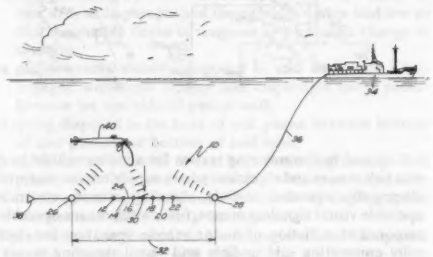


second means responsive to received signals which pass said comparator for changing said base threshold in predetermined relatively large increments.

3,944,966
VERSATILE AT-SEA TEST ARRAY AND ANALYSIS SYSTEM

Robert A. Rubega, Groton, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 21, 1974, Ser. No. 525,691
Int. Cl.² G01S 7/54, 3/80
U.S. Cl. 340—5 C **8 Claims**



1. A test array system for testing sonar systems in a body of water which comprises:

a plurality of transducer elements being arranged in a linear array;

a pair of transponders, one of said pair of transponders being located adjacent one end of said linear array and the other transponder of said pair of transponders being located adjacent the other end of said linear array; and

sensing means for tracking, said sensing means being located adjacent the mid point of said linear array.

3,944,967
UPDATED DIVER NAVIGATION DEVICE

Robert S. Acks; Stanley J. Watson, both of San Diego, and Howard B. McCracken, Poway, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 23, 1974, Ser. No. 535,542
Int. Cl.² G01S 3/80
U.S. Cl. 340—6 R **4 Claims**

1. An underwater navigation system comprising:

a beacon transmitter structured for transmitting a series of frequency shift, FSK, keyed transmissions and including;

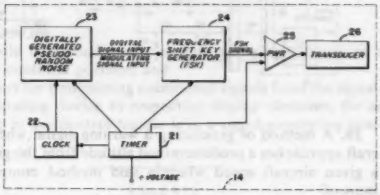
a source of electrical power, and

timer means connected between said source of electrical power of said beacon transmitter and the individual circuits thereof for energizing said circuits at predetermined intervals to produce a low, power-conserving duty cycle; and

a beason receiver configured for location at a station remote from said beacon transmitter for receiving the signals from said beacon transmitter and display of a bearing angle therebetween and including,

three spaced hydrophones located at points spaced as the verticies of an equilateral triangle,

a plurality of FSK signal processing means each of which is operatively connected to one of said hydrophones to be associated therewith for processing the electrical outputs therefrom to obtain an amplified and detected output signal corresponding to the signal transmitted by the aforesaid beacon transmitter,



digital phase comparator means connected to said FSK signal processing means for timely comparison of the output signals therefrom to obtain a signal corresponding to the sine and cosine of the bearing angle to be displayed,

digital error rejection circuitry operatively connected to said digital phase comparator means so as to receive the sine and cosine signals therefrom and sample said signals to distinguish real from spurious signals,

digital latch circuit means operatively connected to said digital error rejection circuitry for storing the distinguished real signals until updated by a subsequent reception of transmitted beacon information, and

display means operatively connected to said digital latch circuit means for converting said real signals to a visual signal indicating the bearing angle between the beacon receiver and the beacon signal source.

3,944,968
AIRCRAFT GROUND PROXIMITY WARNING SYSTEM HAVING SPEED VERSUS ALTITUDE COMPENSATION

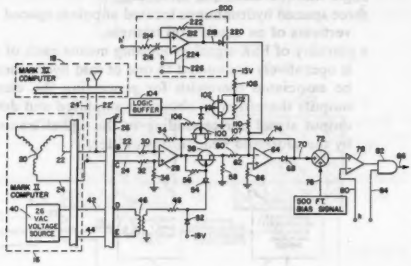
Charles D. Bateman, Bellevue, and Hans Rudolf Muller, Kirkland, both of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Nov. 1, 1974, Ser. No. 520,138
Int. Cl.² G01C 5/00
U.S. Cl. 340—27 AT **29 Claims**

1. A ground proximity warning system for aircraft for generating a warning signal when the aircraft is below predetermined altitudes for various speeds of the aircraft comprising:

means for generating a signal representative of the minimum safe altitude above terrain of the aircraft as a function of the forward speed of the aircraft; and

means for comparing said minimum safe altitude above the terrain signal with a signal representing the actual altitude above the terrain of the aircraft for generating a warning signal when said actual altitude is above the minimum above the terrain altitude as represented by said minimum safe altitude signal.



28. A method of generating a warning signal when an aircraft approaches a predetermined altitude from the ground for a given aircraft speed wherein said method comprises the steps of:

generating, in response to the speed of the aircraft, a signal representation of a minimum safe altitude above the ground for the forward speed of the aircraft;

comparing said minimum altitude to the aircraft's actual altitude above the ground; and

generating a warning signal when said minimum altitude is greater than the actual altitude above the ground.

3,944,969

CENTRAL WARNING APPARATUS FOR VEHICLES

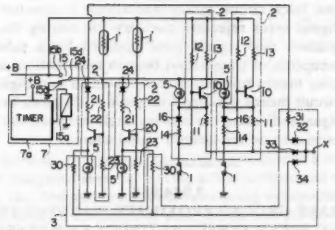
Hiroshi Arai, Toyota; Yohei Watanabe, Okazaki; Jun Ohta; Nobumasa Higo, both of Toyota, and Yasuhiko Sakurai, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Oct. 16, 1973, Ser. No. 406,861

Claims priority, application Japan, Oct. 18, 1972, 47-104806

Int. Cl.² G08B *19/00*

U.S. Cl. 340—52 F **11 Claims**



1. A central warning apparatus for vehicles comprising:

a plurality of sensors each mounted on a vehicle portion to be inspected and adapted to be shifted to a normal state when the portion is in a normal state and to an abnormal operation state when the portion is in an abnormal state,

display means provided in correspondence with each said sensor for providing an output signal indicating abnormality of the respective portions to be inspected,

checking means connected to said display means for selectively operating said display means so as to check the states of operation of said display means and said sensors,

a plurality of discriminator circuits each connected between one of said sensors and said display means and to said checking means for producing an output signal to operate said display means when one of said sensors is in an abnormal state and for operating said display means, in a checking mode of operation, only when a respective series circuit consisting of said display means, said discriminator circuit and said sensor is formed,

an OR-gate circuit connected to a plurality of said display means for generating an output signal in response to at least one output signal of one of said plurality of discriminator circuits, and

a main warning circuit means connected to said OR-gate circuit for indicating abnormality of at least one of the plurality of portions to be inspected in response to an output signal of said OR-gate circuit.

3,944,970

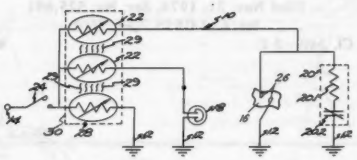
SEAT BELT MONITORING SYSTEM AND CONTROL DEVICE THEREFOR

Richard L. Jenne, Attleboro; Leo Marcoux, and Thomas E. Evans, both of Rehoboth, all of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 1, 1974, Ser. No. 520,185

Int. Cl.² B60R *21/10*

U.S. Cl. 340—52 E **8 Claims**



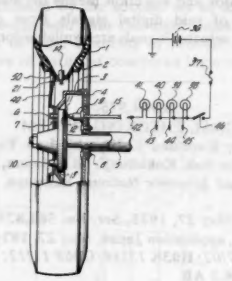
1. A seat belt monitoring system for a motor vehicle having seat belt means and electrical power supply means comprising electrically operable audible signaling means, electrically operable visual signaling means, first switch means operable in response to initiation of motor vehicle operation for electrically connecting said audible and visual signaling means in parallel to said power supply to permit operation of said signaling means, additional switch means operable in response to fastening of said seat belt means to prevent operation of said audible signaling means when said seat belt means is fastened, a first resistor means of positive temperature coefficient of resistivity which displays a sharp increase in resistivity in response to heating of said first resistor means to a predetermined operating temperature, said first resistor means being disposed in series with said visual signaling means and said power supply to prevent operation of said visual signaling means when said first resistor means is heated to its predetermined operating temperature, a second resistor means of positive temperature coefficient of resistivity which displays a sharp increase in resistivity in response to heating of said second resistor means to a predetermined operating temperature, said second resistor means being disposed in series with said audible signaling means and said power supply to prevent operation of said audible signaling means when said second resistor means is heated to its predetermined operating temperature, and electrical heater means disposed in selected heat-transfer relation to said first and second resistor means operable in response to initiation of said motor vehicle operation to heat said first and second resistor means to said predetermined operating temperatures for said first and second resistor means with selected time delay after initiation of said motor vehicle operation.

3,944,971

HIGH/LOW TIRE PRESSURE SIGNAL DEVICE

Ciro Ramirez, Midway City, Calif., assignor to Ciro Ramirez; Edward J. Readman; Norman St. Jean and S. T. Chavarria, all of Midway City, Calif.

Filed Oct. 21, 1974, Ser. No. 516,370
Int. Cl.² B60C 23/02
U.S. Cl. 340—58 3 Claims



1. A tire pressure signal device for a vehicle having a pneumatic tire mounted on a wheel, comprising:

a housing having a bore formed therein, said wheel having a central portion merging outwardly into a pair of annular rims for engaging the inner periphery of said tire, and said housing mounted on said central portion of said wheel;

a diaphragm disposed within said bore and closing one end thereof;

means providing a pneumatic connection between the outer side of said diaphragm and the pressure within said tire so that diaphragm flexes in response to a pressure change in said tire;

a piston axially slidably disposed in said bore with a top engaged with inner side of said diaphragm and a protuberance on one side of piston wall;

a spring disposed in the bore of said piston between bottom of said piston and bottom of said bore;

a rod mounted in center of said bore extending through said piston and insulated therefrom, with nut adjustably mounted on top of said rod for selectively varying space between nut and piston protuberance;

signal means responsive to the engagement of the piston protuberance against said nut.

3,944,972

COMMUNICATION DEVICE FOR ASSISTING THE DRIVER OF A VEHICLE

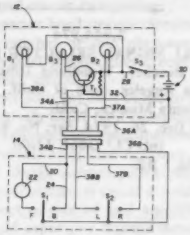
Roy L. Chandler, 4115 Shady Valley Drive, Arlington, Tex. 76013, assignor to Geno Corporation, Arlington, Tex.

Filed Jan. 19, 1973, Ser. No. 325,206
Int. Cl. B60q 1/26; G08b 5/38
U.S. Cl. 340—74 12 Claims

1. Apparatus for conveying guidance and movement instructions to the driver of a vehicle when he cannot adequately determine the spatial relationship of his vehicle to its surroundings, when such instructions can be issued by an observer who is at an advantageous position remote from the vehicle driver, comprising:

a. an indicator panel adapted to be positioned on the vehicle adjacent the driver's station where it may be observed by the driver, said panel having at least three selectively operable display elements, with two of said display elements being adapted to provide right and left steering instructions, and a third display element being adapted to provide movement instructions including stop, move forward, and back up;

b. a signal-generating device adapted to be carried by the observer, said device including means for generating steering and movement signals, and said device including a single control handle which is movable by the observer from a centered position to any selected one of serveral signal-generating positions, with said device being self-canceling such that a display element will convey certain instructions to the driver for only as long as the control



handle is manually held against a biasing element in a non-centered position; and

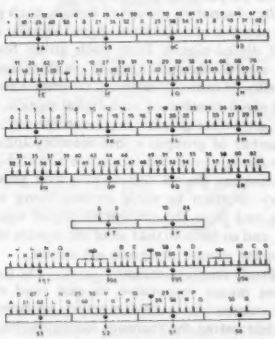
c. means for transmitting continuous signals from the signal-generating device to respective display elements, for as long as the control handle is in a signal-generating position.

3,944,973

ERROR SYNDROME AND CORRECTION CODE FORMING DEVICES

Jean-Jacques Masson, Argenteuil, France, assignor to Compagnie Internationale Pour L'Informatique, Louveciennes, France

Filed Jan. 6, 1975, Ser. No. 538,937
Claims priority, application France, Feb. 19, 1974, 74.05468
Int. Cl.² H04L 1/10; G06F 11/10
U.S. Cl. 340—146.1 AL 5 Claims



1. A device generating the bits of an error syndrome and correction code according to a matrix which defines for each of such bits an appropriate exclusive-or combination of bits in an incoming multi-byte word to process including a parity bit for each byte further to the bits of said bytes, comprising the combination of:

first and second stages of modulo-2 adders, each of a number of available bit inputs at least equal to the number of bits in a byte of the word,

the number of the adders of the second stage being equal to the number of bits in the error syndrome and correction code, each adder of the first stage generating a bit representing an exclusive-or subcombination of bits of the word to be applied to an input of at least one of the adders

of the second stage, adders of the first stage generating the parity check bits of the bytes of the word,

each adder of said second stage receiving a selection of subcombinations from the outputs of adders of said first stage,

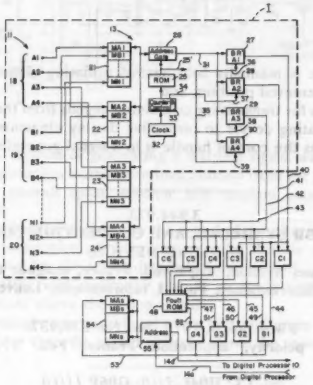
at least some of the adders of said second stage additionally receiving selected bits of the word.

3,944,974

DIGITAL SIGNAL SELECTOR DEVICE

Richard George Buscher, Woodland Hills, and Gunnar M. Soderlund, Los Angeles, both of Calif., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Dec. 26, 1974, Ser. No. 536,360
Int. Cl.² G06F *11/00*
U.S. Cl. 340—146.1 BE **4 Claims**



1. A special purpose digital signal selector device for receiving a plurality of separate groups of signals, each group including a given number of redundant digital signals, and selecting one of said digital signals from each group for subsequent processing, said device including, in combination:

a. a plurality of memory sections corresponding in number to said given number of said digital signals, each section having a number of memory locations corresponding to the number of groups, a first memory location in each section being connected to receive and store respectively the redundant digital signals in a first group, a second memory location in each section being connected to receive and store the redundant digital signals in a next group, and so forth so that all of the signals in the plurality of separate groups of signals are stored;

b. a read only memory means;

c. address means responsive to said read only memory means connected to said memory sections for successively addressing the memory locations therein;

d. a number of buffer register means corresponding to said given number of digital signals in each group respectively connected to the output of said address means;

e. clock means connected to said read only memory means for cycling said address means to transfer the digital signals in the first memory locations of said sections making up the first group of redundant digital signals for storage respectively in successive ones of said buffer register means so that a first buffer register means stores a first digital signal, a second buffer register means stores a second digital signal and so forth until all of the digital signals of said first group are stored;

f. comparator and selection means connected to said buffer register means for comparing and selecting a preferred one of the digital signals in the first group stored therein, said clock means and read only memory means cycling said address means to transfer the digital signals in the second memory locations of said sections making up the next group of redundant digital signals for storage in said buffer register means, said same comparator and selection means then selecting a preferred one of the digital signals in said next group stored in said buffer register means under control of said clock means; and

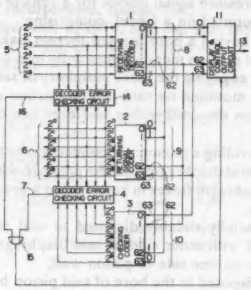
g. a high speed memory section connected to the output of said comparator and selection means for storing the selected ones of said digital signals from each group whereby said selected signals are available for subsequent processing.

3,944,975

SIGNAL CHECKING SYSTEM

Seiichi Yasumoto; Kazuhiko Kobayashi; Isao Yasuda, all of Hitachi, and Ken Itoh, Kokubunji, all of Japan, assignors to Hitachi, Ltd. and Japanese National Railways, both of, Japan

Filed May 27, 1975, Ser. No. 580,825
Claims priority, application Japan, May 27, 1974, 49-58807
Int. Cl.² H04L *17/02*; H03K *13/34*; G06F *11/12*; G05B *1/03*
U.S. Cl. 340—146.1 AB **6 Claims**



1. A signal checking system comprising a returning signal coder to which a plurality of individual single signals are applied in a first order to be converted into corresponding scale-of-N coded output signals ($N \geqq 2$), a checking coder to which said same individual single signals are applied in a second or reverse order to be converted into corresponding scale-of-N coded output signals, and a complement checking circuit for checking the complementary relation between the output of said returning signal coder and the output of said checking coder.

3,944,976

ELECTRONIC SECURITY APPARATUS

Rode France, 880 La Cuesta, Los Altos, Calif. 94022

Filed Aug. 9, 1974, Ser. No. 496,005
Int. Cl.² H04Q *3/00*
U.S. Cl. 340—146.2 **11 Claims**

1. Electronic security apparatus comprising:

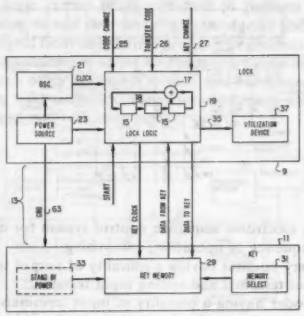
a first set of a plural number N of logic elements capable of attaining distinct logic states interconnected to provide a plurality of logic states or bits;

first gate means having an input connected to the output of the Nth logic element of the first set and having an output connected to the first of the N number of logic elements of the first set for operation therewith as a shift register which produces a selectably changeable pattern of logic states in the first set;

a second set of a plural number of at least N logic elements capable of attaining distinct logic states and interconnected to provide a plurality of logic states or bits;

second gate means having an input connected to the output of the Nth logic element of the second set and having an output connected to the first of the N number of logic elements of the second set for operation therewith as a shift register which produces a selectably changeable pattern of logic states in the second set;

third gate means having an input port connected to the output of the Nth logic element of the first set and having another input port for receiving manifestations of logic states attained by the second set of logic elements for serial comparison with the logic states attained by said first set of logic elements to provide an output signal indicative of parity of compared logic states;



transfer means selectively enabled to couple the logic elements of the first set to the logic elements of the second set for selectively transferring the pattern of logic states from one set to the other set of logic elements;

means for selectively coupling an output of said second set of logic elements to said other input port of the third gate means for selectively comparing therein the logic states serially received from said first and second sets of logic elements; and

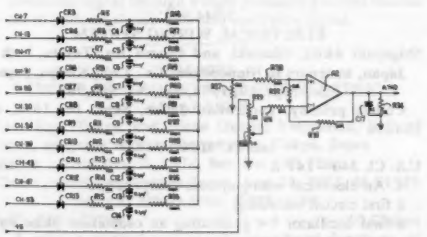
utilization means connected to said third gate means for responding to said output signal upon occurrence of parity of compared logic states.

3,944,977

ADAPTIVE AND PROGRAMMED THRESHOLD LEVEL DETECTION ARRANGEMENT

Thomas G. Holmes, and Kenneth L. Seib, both of Melbourne, Fla., assignors to Optical Business Machines, Melbourne, Fla.

Filed May 21, 1974, Ser. No. 472,069
Int. Cl.² G06K 9/12
U.S. Cl. 340—146.3 AG **3 Claims**



1. In an optical character recognition machine of the type in which a beam of light is caused to scan across successive lines of characters and reflect onto an array of sequentially adjacent photosensitive elements, each of which drives an amplifier to provide an electrical signal at a reference level when a non-character portion of the line is reflected thereon and at a character level when a character portion of the line is reflected thereon, a threshold control circuit for varying a threshold level to which said character level is compared in a character recognition process, said threshold control circuit serving to compensate for variations in said reference level, said threshold control circuit comprising:

a plurality of reference level storage circuits numbering less than half the number of said photosensitive elements, each reference level storage circuit comprising:

capacitive storage means;

a charge current path for said capacitive storage means having a relatively short time constant;

a discharge current path for said capacitive storage means having a relatively long time constant;

a diode in said charge current path connected and poled to conduct said electrical signal at said reference level from a respective one of said amplifiers as charging current to said capacitive storage means;

wherein the amplifiers providing electrical signals to said reference level storage circuits are driven by photosensitive elements which are all spaced from one another in said array to enhance the probability that at all times at least one of the spaced photosensitive elements has a noncharacter portion of a scanned line reflected thereon; and

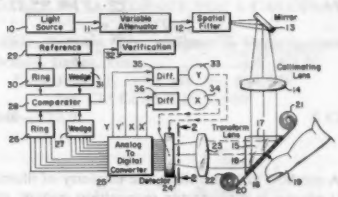
averaging circuit means connected in the discharge current path of each of said reference level storage circuits for averaging the levels stored in all of said capacitive storage means and providing said threshold level as a function of that average.

3,944,978

ELECTRO-OPTICAL METHOD AND APPARATUS FOR MAKING IDENTIFICATIONS

Niels P. Jensen, Los Angeles; Harvey L. Kasdan, Van Nuys, and James T. Thomasson, Sunland, all of Calif., assignors to Recognition Systems, Inc., Van Nuys, Calif.

Filed Sept. 9, 1974, Ser. No. 504,185
Int. Cl.² G06K 9/00
U.S. Cl. 340—146.3 E **8 Claims**



1. A method of verifying a person's identity comprising the steps of:

a. storing a reference electrical function corresponding to a reference diffraction pattern formed by radiating with coherent light an invariant physical reference characteristic of a given person by detecting the referenced diffraction pattern by means of a solid state detector made up of semi-circular ring segments and radially extending wedge segments to provide ring reference signals and wedge reference signals simultaneously;

b. positioning an invariant physical sample characteristic of a person for radiation by coherent light to cause generation of a sample diffraction pattern of said characteristic;

c. detecting the frequency domain of the entire sample diffraction pattern simultaneously to provide a sample electrical function thereof by means of a solid state detector made up of semi-circular ring segments and radially extending wedge segments to provide ring sample signals and wedge sample signals simultaneously;

d. maintaining said solid state detector centered relative to said sample diffraction pattern by providing means on said solid state detector for generating error signals in response to an off-centering of the diffraction pattern and utilizing the error signals to center said solid state detector to assure that the same conditions exist as when said referenced diffraction pattern was detected; and

e. comparing said reference electrical function to said sample electrical function by correlating the reference and sample ring signals together and cross-correlating the reference and sample wedge signals together so that the resulting correlation is rotationally invariant whereby if a correlation exists within a given tolerance it is known that the person from which the sample electrical function is derived corresponds to said given person.

3,944,979

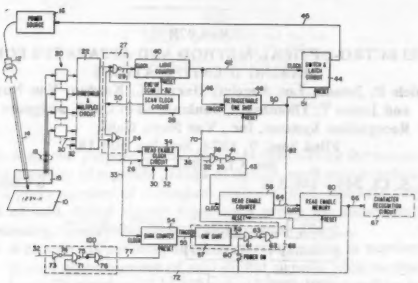
METHOD AND APPARATUS FOR ILLUMINATING AN OBJECT BEARING INDICIA

Kenneth Kwok, Inglewood, Calif., assignor to Data Source Corporation, Wilmington, Del.

Filed Dec. 23, 1974, Ser. No. 535,767

Int. Cl.² G06K 7/14

U.S. Cl. 340—146.3 AG **18 Claims**



1. A method for controlling the intensity of illumination of a light source in a character recognition system, comprising the steps of:

sensing reflected light with a plurality of detectors;

producing an output signal at the output of each of said detectors in response to said reflected light, said output signal being indicative of the intensity of the reflected light;

generating a first signal when said detector output is equal to or greater than a predetermined threshold;

generating a second signal when said detector output is less than said predetermined threshold;

generating a first sum signal representing the number of said first signals generated;

generating a second sum signal representing the number of said second signals generated;

operating said light source at a first light intensity when said sum signal is equal to or greater than a first preselected sum; and

operating said light source at a second light intensity when said second sum signal is equal to or greater than a second preselected sum.

3,944,980

ELECTRONIC SEQUENCE CONTROL SYSTEM

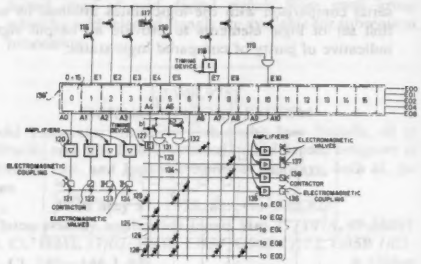
Georg Riedmayr, Munich, Germany, assignor to Carl Hurth, Maschinen- und Zahnradfabrik, Munich, Germany

Filed Aug. 14, 1974, Ser. No. 497,332

Claims priority, application Germany, Aug. 30, 1973, 2343664

Int. Cl.² H04Q 9/00; H03K 17/28

U.S. Cl. 340—147 P **7 Claims**



1. An electronic sequence control system for controlling a given sequence of operation, comprising:

a binary counter having a plurality of output terminals, an input terminal and setting input terminal;

a decoder having a plurality of input terminals electrically connected to said output terminals of said binary counter and a plurality of output terminals, said plurality of output terminals being connected to selected components in said operation to effect the performance of a desired task in said sequence of operation;

a multiplexer having a plurality of first input terminals electrically connected to said output terminals of said binary counter, a plurality of second input terminals having electrical signals applied thereto in response to functions performed during said desired task, and a single output terminal, selected ones of said first input terminals controlling selected ones of said second input terminals to control which signal is to appear at said single output terminal; and

an AND-gate having two input terminals and a single output terminal, one of said input terminals to said AND-gate being electrically connected to said single output terminal of said multiplexer, the other input terminal being connected to a pulse generator so that said AND-gate will supply a signal to said output terminal thereof only when a signal is present on both of said input terminals thereof, said output terminal of said AND-gate being connected to said input terminal to said binary counter to effect an advancement of said binary counter to the next level.

3,944,981

ELECTRICAL WIRING SYSTEM

Shigeyuki Akita, Okazaki, and Osamu Ito, Toyota, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sept. 10, 1974, Ser. No. 504,983

Claims priority, application Japan, Sept. 14, 1973, 48-104430

Int. Cl.² H04Q 11/00

U.S. Cl. 340—147 R **6 Claims**

1. An electrical wiring system comprising:

a first circuit including;

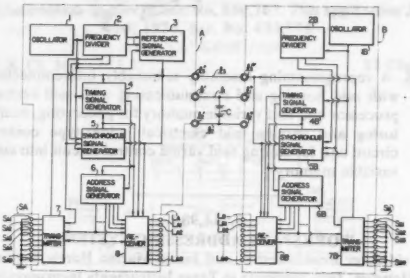
a first oscillator for generating an oscillation pulse signal having a fixed frequency,

a reference signal generating circuit responsive to said oscillator for dividing the frequency of an output signal of said oscillator and for generating a reference signal, said reference signal having a predetermined period equal to a plurality of cycles of said divided signal and having a

group of high frequency pulses at a reference time interval in said predetermined period for effecting timing,

a first address designating circuit responsive to said reference signal generating circuit for generating a first set of address signals, said first address designating circuit being operable in synchronization with said high frequency pulses in said reference signal and generating said first set of address signals for designating a plurality of addresses by time division of said predetermined period of said reference signal subsequent to the time of synchronization into a plurality of addresses, and

a transmitter logic circuit connected to said first address designating circuit, said reference signal generator and an instruction unit for generating multiplex signal, said transmitter logic circuit being operable to perform a logic processing of said first set of address signals and a command signal from said instruction unit to produce a series signals containing a series of command pulses separated from each other in respect to time and being operable to produce said multiplex signal by combining said series signal and said reference signal;



a single signal line connected to said transmitter logic circuit of said first circuit for transmitting said multiplex signal from said transmitter logic circuit; and

a second circuit including;

a second address designating circuit connected to said single signal line for generating a second set of address signals, said second address designating circuit being operable in synchronization with said high frequency pulses of said reference signal contained in said multiplex signal and generating said second set of address signals for designating addresses respectively by time division of said predetermined period of said reference signal subsequent to the time of synchronization into the same number of addresses as in said first address designating circuit, and

a receiver logic circuit connected to said single signal line and said second address designating circuit for controlling the actuation of each load corresponding to said command signal through a logic processing of said second set of address signals and said multiplex signal.

3,944,982
REMOTE CONTROL SYSTEM FOR ELECTRIC APPARATUS

Takao Mogi, Tokyo, and Hisao Okada, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 6, 1974, Ser. No. 495,296
Claims priority, application Japan, Aug. 16, 1973, 48-91959
Int. Cl.² H04Q 9/00; H03K 5/20
U.S. Cl. 340—171 R **10 Claims**

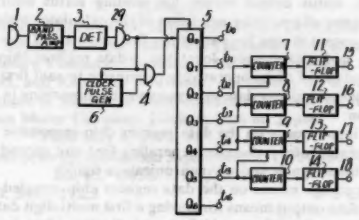
1. A remote control system wherein plural functions of electric apparatus are selectively controlled in accordance with a received command signal having a single frequency and repetitive transmission periods, the duration of a transmission period being determinative of a particular function, comprising:

receiving means for receiving said command signal;

detecting means coupled to said receiving means for producing pulses having durations corresponding to the durations of the received transmission periods of said received command signal;

measuring means coupled to said detecting means for measuring the duration of each produced pulse and for selectively producing one of a plurality of output pulses in accordance with the measured duration of said produced pulse;

counter means coupled to said measuring means for counting the consecutive number of each of said output pulses produced by said measuring means to thereby provide a



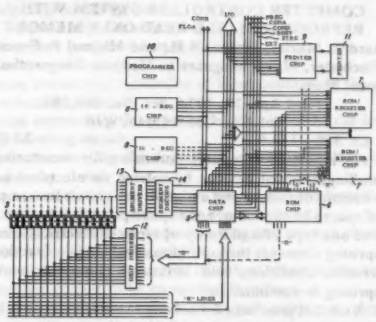
count of the number of consecutive repetitions of transmission periods having the same duration which are received by said receiving means; and

control signal generating means coupled to said counter means for generating one of a plurality of control signals depending upon the output pulses produced by said measuring means and only if said counter means counts at least a predetermined number of said output pulse representing that at least said predetermined number of consecutive repetitions of a command signal having a selected transmission period has been received, said generated control signal being adpated to control a selected function.

3,944,983
EXPANDABLE DATA STORAGE FOR A CALCULATOR SYSTEM

Pliny M. Gale, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 11, 1973, Ser. No. 368,906
Int. Cl.² G06F 9/10, 13/00
U.S. Cl. 340—172.5 **5 Claims**



1. In a calculator system of the type implemented on first and second sets of semiconductor chips with the first set of semiconductor chips having keyboard input means for entering data and functions, a plurality of separate data memory locations for storing in bit-parallel format a plurality of multi-

digit words of coded information, wherein the data memory locations comprise addressable memory means, addressable storage means for storing a plurality of program instructions for controlling the operation of the calculator system, control means for receiving the program instructions and generating control connections according thereto, parallel arithmetic logic means connected to the control means and to the data memory locations for performing parallel arithmetic and logic operations on the multi-digit coded words from the data memory locations one digit at a time, multi-digit display means connected to the data memory locations for displaying the numerical results of calculations made by the calculator system, timing means for producing timing signals for strobing the keyborad input means and the display means during a scan cycle, status output means for sending status information indicative of operating condition of the calculator system and data output means for outputting first and second data words from said data memory locations, a data register chip of the second set of chips operatively responsive to said first set for providing auxiliary data storage capacity comprising in combination:

a. input means on the data register chip responsive to said status information for generating first and second operations signals and a synchronization signal;

b. storage means on the data register chip coupled to said data output means for storing a first multi-digit data word transmitted from said first set indicative of an input/output operation command and further indicative of the particular register to be addressed among a set of registers in the data register chip;

c. register storage means on the data register chip addressable for inputting or outputting data in accordance with said first and second operations signals, including a set of individually addressable registers;

d. register timing means on the data register chip for driving said set of registers in timed relationship with said timing signals in said first set of chips in response to said synchronization signal;

e. first decode means on the data register chip responsive to said first data word for selectively addressing at least one of the set of registers of said register storage means; and

f. input delay means coupling said storage means to said data output means for communicating a first set of digits of a second data word to the selected one of the set of registers sequentially without delay and for communicating at least one other digit of said second data word to said selected one of the registers after a preselected delay.

3,944,984

COMPUTER CONTROLLER SYSTEM WITH A REPROGRAMMABLE READ ONLY MEMORY

Richard E. Morley, Mason, N.H., and Michael P. Greenberg, Winchester, Mass., assignors to Modicon Corporation, Andover, Mass.

Filed Apr. 23, 1974, Ser. No. 463,281
Int. Cl.² G06F 15/46, 9/16
U.S. Cl. 340—172.5 **23 Claims**

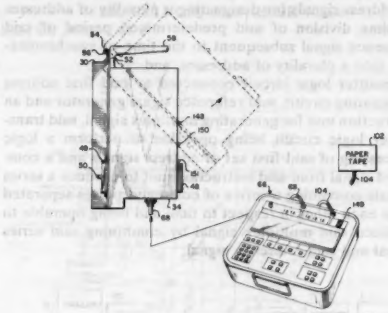
1. An industrial computer controller for monitoring and controlling external devices by solving an electrical ladder-type control circuit having a plurality of circuit lines, a plurality of spaces in each line, each space providing for the inclusion of one type of a plurality of types of electrical elements comprising elements the condition of which is a function of a referenced condition, said industrial computer controller comprising in combination:

A. A central processor for solving the electrical circuit lines including the generation of circuit line condition specifying information;

B. an input/output assembly communicating with the central processor for receiving, transforming, and transferring at least a portion of said circuit line condition specifying information to intercommunicating external devices and for receiving, transforming, and transferring at least a portion of the information generated by said external devices to said central processor;

C. A variable memory for the storing of said electrical ladder-type control circuit;

D. A housing incorporating said central processor and said variable memory; and



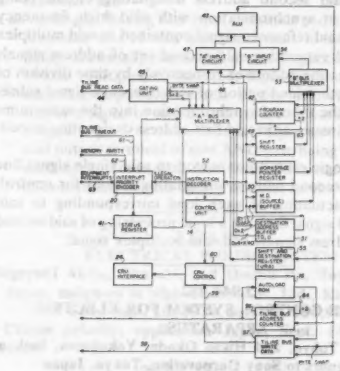
E. A reprogramming assembly removably interconnected with said housing and communicating with said central processor and said variable memory for generating, monitoring and varying said electrical ladder-type control circuit and for storing said varied control circuit into said variable memory.

3,944,985

WORKSPACE ADDRESSING SYSTEM

David Peter Brandstaetter, and James Marian Harris, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 19, 1973, Ser. No. 408,150
Int. Cl.² G06F 9/06
U.S. Cl. 340—172.5 **3 Claims**



1. A digital computer system providing flexibility in the high-speed selection and utilization of a plurality of multielement workspaces in main memory, comprising:

a. a workspace pointer register to store the address of the first of a set of consecutive memory locations forming workspace in main memory;

b. a program counter register to store the address of the current program instruction being executed;

c. a status register to store a current indication of the status of the program being executed;
d. control memory means to supply a distination code to be added to the contents of the workspace pointer register to form the distination address;
e. an arithmetic logic unit which sums the destination code with the contents of the workspace pointer register;
f. an address register to store the output of the arithmetic logic unit; and
g. means to store the address of the first element of a prior workspace at the destination address in response to an interrupt condition.

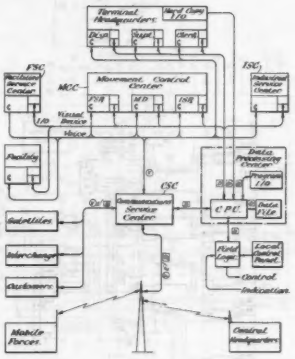
3,944,986
VEHICLE MOVEMENT CONTROL SYSTEM FOR RAILROAD TERMINALS

Crawford E. Staples, Edgewood, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Continuation-in-part of Ser. No. 124,270, March 15, 1971, abandoned, and a continuation-in-part of Ser. No. 830,767, June 5, 1969, abandoned, said Ser. No. 124,270, Continuation-in-part of Ser. No. 830,767. This application Jan. 16, 1974, Ser. No. 433,775

Int. Cl.² G06F *15/48*

U.S. Cl. 340—172.5 **12 Claims**



1. In a railroad terminal control system having a central control location, a digital computer central data processing means programmed to respond to the recording of a selected work assignment for developing from stored vehicle inventory data an itemized list of successive work steps necessary to complete that work assignment and further programmed to respond to the reception of a work list item completion report from a selected work unit for checking the correctness of the work item completed, and a plurality of mobile work units; the combination comprising,
a. communication apparatus coupled for providing a data transmission channel between said control location, said central data processing means, and said mobile work units,
b. movement control means at said control location operable for selecting a work assignment and connected for recording that assignment in said central data processing means,
c. said central data processing means connected to said communication apparatus for transmitting the corresponding itemized work list to a selected mobile work unit,
d. recording means at each mobile work unit connected to said communication apparatus for receiving and recording an itemized work list transmitted to that work unit, and
e. information transmitting means at each work unit connected to said communication apparatus for successively reporting completion of each item of a recorded work list to said central data processing means,
f. said central data processing means also connected for transmitting control signals to authorize said selected work unit to undertake the successive item on the recorded work list only when the reported work item was correctly completed.

3,944,987
DIGITAL LOGICAL SEQUENCE CONTROLLER

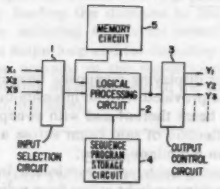
Haruo Koyanagi, Tokyo; Masayoshi Takahashi, both of Japan; Nobuharu Yamauchi, Amagasaki; Masaji Matsumura, Amagasaki, and Katsuhide Morimoto, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo and Nissan Motor Company, Limited, both of, Japan

Filed May 6, 1974, Ser. No. 467,142

Claims priority, application Japan, May 7, 1973, 48-50420

Int. Cl.² G05B *11/01*; G06F *9/00*

U.S. Cl. 340—172.5 **5 Claims**



1. A sequence controller comprising:
an input selection circuit;
a logical processing circuit;
an output control circuit;
a sequence program storage circuit;
a memory circuit;
means connecting a plurality of input contacts to the input selection circuit;
means connecting the input selection circuit to the logical processing circuit;
means connecting the logical processing circuit and the memory circuit;
means connecting the memory circuit and the logical processing circuit to the output control circuit;
means connecting the sequence program storage circuit to the logical processing circuit;
means connecting a plurality of output relays to the output control circuit to be controlled thereby;
the sequence program storage circuit storing a relay sequence having branch points;
the level of each branch point and its on-off state being stored in the memory circuit;
whereby data from the plurality of input contacts is processed in accordance with the relay sequence stored in the sequence program storage circuit to control the output relays.

3,944,988

IMAGE-DISPLAY SYSTEM INTERACTING WITH LIGHT PEN

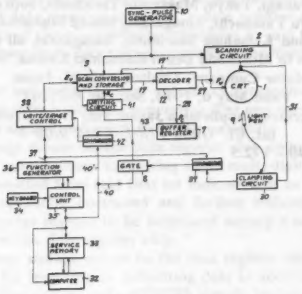
Jean Jacques Mayer, Paris, France, assignor to Compagnie Internationale Pour L'Informatique - C.I.I., Louveciennes, France

Continuation-in-part of Ser. No. 428,360, is a continuation of Ser. No. 89,799, Nov. 16, 1970, abandoned. This application July 29, 1974, Ser. No. 492,920

Claims priority, application France, Nov. 21, 1969, 69.40101

Int. Cl.² G06F 3/14

U.S. Cl. 340—172.5 10 Claims



1. A system for displaying composite images, comprising:

an oscilloscope provided with an intensity-control input for an electron beam thereof and with sweep means for the periodic deflection of said beam across a screen to produce thereon a luminous trace;

a light pen juxtaposable with a selected location on said screen for picking up light pulses from a displayed trace;

a computer provided with memory means for the storage of a multiplicity of code words identifying different components of an image to be traced on said screen;

function-generating means coupled to said memory means and responsive to a code word read out therefrom for producing an analog signal representing a corresponding image component;

storage means connected to said function-generating means for temporary loading by an analog signal generated in response to the readout of a code word from said memory means, said analog signal giving rise to a pattern of unipolar video pulses of a first amplitude in said storage means;

gating means controlled by said light pen for inscribing a selected code word, associatd with an image component touched by the light pen, in said storage means in the form of a pattern of code pulses having the same polarity as said video pulses, of a second amplitude different from said first amplitude, superimposed upon said pattern of video pulses;

scanning means synchronized with said sweep means for sequentially extracting the pulses of the superposed patterns from said storage means in the form of a unipolar pulse train with three distinct voltage levels besides zero;

decoder means connected to said storage means for receiving said unipolar pulse train therefrom and deriving from said three voltage levels thereof a video-pulse train delivered to said intensity-control input and a code-pulse train corresponding to the selected code word; and

display-modification means connected to said decoder means for altering the appearance on said screen of the image component corresponding to said selected code word.

3,944,989

PATTERN INFORMATION MEMORY USING CIRCULATING MEMORIES

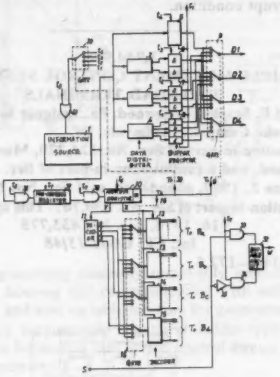
Minoru Yamada, Gotenba, Japan, assignor to Takachiho Koeki Kabushiki Kaisha, Japan

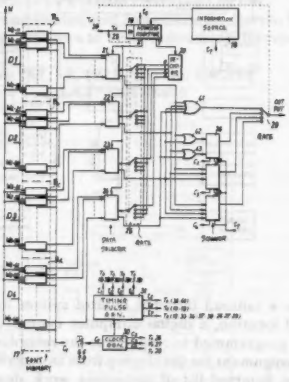
Continuation-in-part of Ser. No. 416,654, Nov. 16, 1973. This application June 16, 1975, Ser. No. 586,928

Claims priority, application Japan, Nov. 17, 1972, 47-115437

Int. Cl.² G11C 7/00, 21/00

U.S. Cl. 340—172.5 2 Claims





1. A pattern information memory for storing a plurality of unit patterns, comprising:

font memory means having a total bit capacity of $n \cdot A$ and comprising a number A of circulating memories each having a rewritable n-bit capacity, each bit being capable of storing one dot obtained by dot decomposition from each unit pattern each unit pattern information including an address code;

switching means operatively connected to said font memory means for switching designated addresses in said font memory means in accordance with a value of a number m (m=1, 2, 3, . . . less than the number A) to provide a memory capacity of (n.A)/(n.m) patterns in combination of a number m of said circulating memories per each pattern of $n \cdot m$ dots;

first control means controlled by said address code and operatively connected to said font memory means and said switching means for controlling said switching means to store each pattern information by making one access

to a number m of said circulating memories within a unit access time for one bit in a case: $m=1$; means providing a reading-out signal, said signal including a reading address code

second control means controlled by said reading address code and operatively connected to said font memory means and said switching means for controlling said switching means to read out each stored pattern information by making one access to a number m of said circulating memories within said unit access time for one bit in a case: $m=1$,

whereby, the writing operation and the subsequently reading-out operation for each pattern information is each performed in a constant period of time irrespective of the value of the number m.

3,944,990

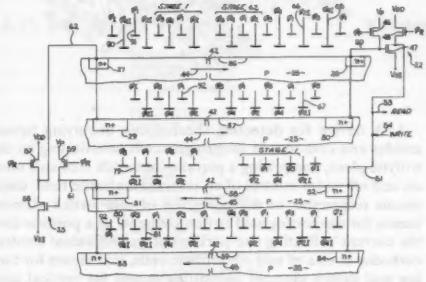
SEMICONDUCTOR MEMORY EMPLOYING CHARGE-COUPLED SHIFT REGISTERS WITH MULTIPLEXED REFRESH AMPLIFIERS

Sunlin Chou, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 6, 1974, Ser. No. 530,161

Int. Cl.² G11C *19/28, 21/00, 7/00*

U.S. Cl. 340—173 RC **17 Claims**



1. A charge-coupled memory comprising:

a plurality of charge-coupled shift registers, each of said shift registers including a first pair of channels and a second pair of channels, each of said channels being defined by a first region and a second region;

a plurality of refresh means each for receiving an output charge from said second regions of said first pair of channels and for providing a refreshed charge to said second regions of said second pair of channels, and for receiving an output charge from said first regions of said second pair of channels and for providing a refreshed charge to said first regions of said first pair of channels;

multiplexing means for multiplexing charge between said refresh means and said second regions of said first pair of channels and said second pair of channels, and for multiplexing charge between said refresh means and said first regions of said second pair of channels and said first pair of channels; and

phased signal means for shifting charge in said shift registers coupled to said shift registers;

whereby information may be stored and refreshed in said shift registers.

3,944,991

MAGNETIC DOMAIN MEMORY ORGANIZATION

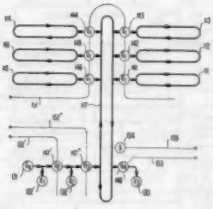
Hiroshi Murakami, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed July 12, 1974, Ser. No. 487,945

Claims priority, application Japan, July 12, 1973, 48-79012; July 31, 1973, 48-86613; July 31, 1973, 48-86614; July 31, 1973, 48-86615; July 31, 1973, 48-86616

Int. Cl.² G11C *11/14, 19/08*

U.S. Cl. 340—174 TF **11 Claims**



1. A magnetic memory unit of a major-minor loop construction comprising: a sheet of magnetic material capable of retaining and moving magnetic domains; a magnetically soft overlay for defining a major loop and a plurality of minor loops; means for selectively transferring the domains between the major loop and the minor loops; an input section having a plurality of signal lines and memory gates connected thereto for selectively feeding the domains to the major loop; an output section including means for selectively erasing the domains in the major loop and for detecting the presence and absence of the domains in the major loop; and means for providing a rotating magnetic field to the sheet to propagate the domains on the sheet.

3,944,992

MAGNETO-OPTICAL INFORMATION STORAGE DEVICE USING PHOTOCONDUCTIVE CONTROL ELEMENT

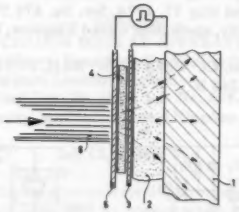
Jens-Peter Krumme, and Bernhard Hill, both of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 4, 1974, Ser. No. 520,533

Claims priority, application Germany, Nov. 16, 1973, 2357301

Int. Cl.² G11B *5/02*

U.S. Cl. 340—174 YC **10 Claims**

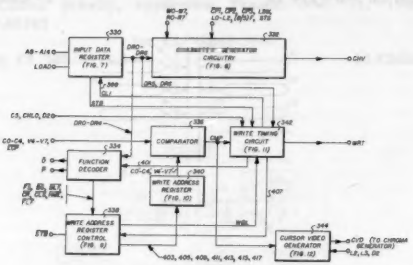


1. An information storage device comprising a storage plate of a magnetizable material, means including a light beam for recording and retrieving information in said storage plate, a photoconductive layer on the magneto-optic material of the storage plate, and electrode means on said photoconductive layer, said electrode means being connected to an electrical power source to heat said layer.

3,944,993
NON-INTERLACED 263 TV LINE CHARACTER GENERATION SYSTEM

James A. Dalke, Bellevue, and Wayne E. Hough, Seattle, both of Wash., assignors to Metro Data Corporation, Seattle, Wash.

Filed Sept. 14, 1973, Ser. No. 397,287
Int. Cl.² G06F 3/14
U.S. Cl. 340—324 AD **4 Claims**



1. A character generation system suitable for creating a video signal adapted to create a color character display with a 263 TV line non-interlaced scan on the screen of a residential type TV receiver, comprising:

a sync generator suitable for generating a plurality of synchronizing signals adapted to create a 263 TV line non-interlaced scan, said synchronizing signals including a coded set of binary signals, said coded set of binary signals defining dots on a TV screen along a 263 TV line non-interlaced scan;

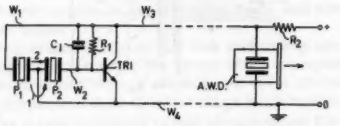
a character generator adapted to receive character nature signals from an external source and synchronizing signals from said sync generator, and generate a character video signal in accordance therewith suitable for application to a residential type TV receiver to create a character display along said 263 TV line non-interlaced scan; and,

a chroma generator connected to said character generator so as to add chroma information to said character video signal whereby said character video signal is suitable for creating a color character display on the screen of a residential type TV receiver along said 263 TV line non-interlaced scan.

3,944,994
LIQUID LEVEL SENSOR

David Geoffrey James Fanshawe, Uckfield, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 17, 1974, Ser. No. 470,799
Claims priority, application United Kingdom, May 21, 1973, 24070/73
Int. Cl.² G08B 21/00; H01L 27/20
U.S. Cl. 340—244 R **13 Claims**

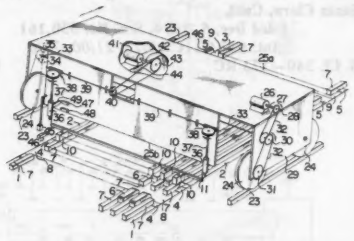


1. A liquid level sensor comprising, piezoelectric sensing means, an oscillator capable of assuming an oscillation state and a non-oscilating state and including a feedback path in which the piezoelectric sensing means is connected, the piezoelectric sensing means comprising first and second piezoelectric elements mounted to provide a first and a second mechanical coupling path between said first and second piezoelectric elements, the first coupling path being arranged to provide one phase of feedback signal for the oscillator and the second mechanical coupling path being arranged to provide a second feedback signal of substantially opposite phase, the second feedback signal only being present when the piezoelectric sensing element is immersed in the liquid and in which the one phase of feedback signal causes the oscillator to assume one of its two states and the addition of the substantially opposite phase of signal causes the oscillator to assume the opposite state.

3,944,995
DEVICE FOR DETECTING SHORT-CIRCUIT BETWEEN ELECTRODES IN ELECTROLYTIC CELL

Takeshi Kobayashi, and Yoshiharu Tanaka, both of Tamano, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed May 20, 1975, Ser. No. 579,070
Int. Cl.² G08B 21/00
U.S. Cl. 340—253 A **11 Claims**



1. A device for detecting short-circuit occurring between anodes and cathodes in electrolytic cells constituting an electrolytic plant, comprising a plurality of switch elements turned on and off under control of an external magnetic field, display means responsive to the operation of said switch elements, means for supporting said switch elements at a position above the current collecting end portions of the individual anodes or cathodes in one of said electrolytic cells, and means for carrying said switch element supporting means for vertical movement and capable of making travelling movement over said electrolytic cells from the position associated with one of said electrolytic cells to the position associated with the adjacent one, the travelling movement of said carrying means controlled so that said switch elements can be accurately brought to the position adjacent to the current collecting end portions of the associated anodes or cathodes in each said electrolytic cell.

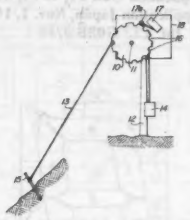
3,944,996
TELEMETRY ALARM SYSTEM

Michael K. McCarter, and Dale J. Green, both of Salt Lake City, Utah, assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Aug. 5, 1974, Ser. No. 494,607
Int. Cl.² G08B 7/06
U.S. Cl. 340—282 **12 Claims**

1. A telemetry alarm system adapted to monitor earth slope stability and to provide an alarm upon the occurrence of earth slope instability, comprising earth slope stability sensing means; means for transmitting electrical signals; timing means connected to said sensing means and said transmitting means and adapted to cause the transmitting means to transmit a signal of predetermined time duration and predetermined carrier and tone frequencies upon the sensing of an unstable condition; receiver means adapted to receive signals transmitted by the transmitting means; decoding means into which

received signals are passed to produce corresponding pulses of durations of respective predetermined tone frequency signals received; time gate means into which said pulses are passed for determining if the respective pulses are within preset maximum and minimum duration limits and for providing an output when a pulse is within said limits; alarm means; alarm activating means responsive to output from said time gate means; and means for providing power to the system.



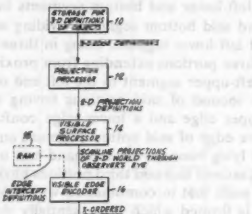
3,944,997
IMAGE GENERATOR FOR A MULTITERMINAL GRAPHIC DISPLAY SYSTEM

Ronald J. Swallow, Upper Marlboro, Md., assignor to Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 462,171, April 18, 1974. This application May 22, 1974, Ser. No. 472,176

Int. Cl.² G06F 3/14

U.S. Cl. 340—324 AD **8 Claims**



1. A graphics display system for a display terminal having a display screen for visibly displaying selected points of a raster of display points arranged along regular scanlines, said system including a visible edge encoder comprising:

means for storing a set of edge intercept signals, each edge intercept signal comprising signals positioning a visible intercept point at a selected position along a selected scanline of the display screen and signals defining a plurality of selected visible characteristics of a portion of the same scanline which is adjacent the intercept point;

means responsive to said edge intercept signals in the storing means for generating a plurality of corresponding subsequent signals defining a block of visible edge signals, each visible edge signal comprising signals defining the position of a continuous visible edge along a line on the display screen which need not coincide with a scanline and signals defining selected visible characteristics of a selected two-dimensional portion of the display screen which is adjacent the continuous visible edge; and

means for transmitting said block of generated visible edge signals to the display terminal, said terminal including means responsive to said generated visible edge signals for displaying the corresponding continuous visible edges and characteristics of the adjacent two-dimensional screen portions by a raster of visible display points along the scanlines of the display screen.

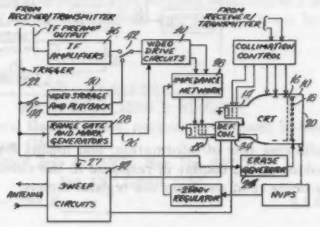
3,944,998
DISPLAY SYSTEM

Robert B. Perkins, 309 Sweet Briar Court, Joppa, Md. 21085

Filed Nov. 4, 1974, Ser. No. 520,798

Int. Cl.² G08B 5/36

U.S. Cl. 340—324 AD **5 Claims**



1. In a radar display system of the type having means for transmitting and receiving radar signals via an antenna:

cathode-ray tube means responsive to received radar signals for displaying information representative of an input applied thereto;

means responsive to the received radar signals for applying an input representative thereof to said tube means;

video storage and playback means for storing recorded video signals to be displayed by said tube means, said recorded video signals representing information different than the information represented by the received radar signals;

said circuit means being further responsive to said recorded video signals for applying an input representative thereof to said tube means;

means for selectively and alternatively connecting said received radar signal or said recorded video signal to said circuit means; and

means connected to the radar antenna and to said tube means for generating raster signals in synchronism with operation of the antenna, to effect display of information represented by said selected input;

whereby said cathode-ray tube means displays information representative of either said received radar signals or said recorded signals in response to said raster signals and said selected input.

3,944,999
COLOUR DISPLAY APPARATUS

John Richard Moore, Knutsford, England, assignor to International Computers Limited, England

Filed Nov. 20, 1974, Ser. No. 525,654

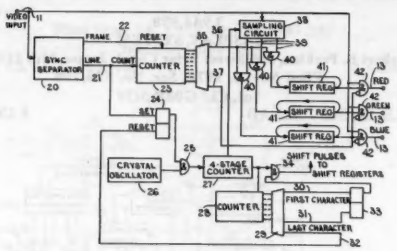
Claims priority, application United Kingdom, Dec. 20, 1973, 59177/73

Int. Cl.² G06F 3/14

U.S. Cl. 340—324 AD **6 Claims**

1. Colour display apparatus for displaying a plurality of rows of information separated by spaces which apparatus comprises: a display device scanned in a raster pattern, the said rows of information comprising a plurality of raster lines and the said spaces each comprising at least one raster line; means for modulating an input signal onto at least the portions of the raster pattern corresponding to the said rows of information; sampling means for deriving a sequence of digital colour codes from the input signal during each period the raster pattern scans one of the said spaces between the rows of information; register means for storing each of the said sequences of colour

codes as it is derived; means for reading out the colour codes from the register means, one at a time, in synchronism with the receipt of the portion of the input signal corresponding to



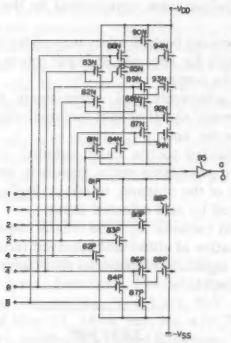
the following row of information; and means for controlling the colour of the display in response to the colour code currently being read out from the register means.

3,945,000

SERIES LOGIC CIRCUIT ARRANGEMENT USING A PLURALITY OF COMPLEMENTARY IGFET'S

Yasoji Suzuki, Kanagawa, and Kenshi Manabe, Musashino, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed July 30, 1974, Ser. No. 493,152
Claims priority, application Japan, July 13, 1973, 48-86159
Int. Cl.² G08B 5/36
U.S. Cl. 340—336 **4 Claims**



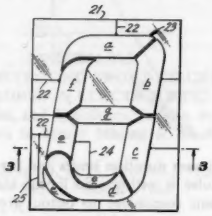
1. In a series logic circuit arrangement using a plurality of P and N channel IGFET's and comprising a plurality of series logic circuits to which a plurality of input binary coded signals are applied, each of said logic circuits being designed to effect a predetermined logic function with respect to any ones of the plurality of input binary coded signals by using at least one P channel IGFET and one N channel IGFET, the improvement in that said P channel IGFET's and N channel IGFET's are arranged according to positive and negative logic systems with respect to the plurality of input binary coded signals, in the negative logic system, said P channel IGFET's being arranged according to a logic equation of minterm-type expression and said N channel IGFET's according to a logic equation of maxterm-type expression, and, in the positive logic system, said P channel IGFET's being provided according to a logic equation of maxterm-type expression and said N channel IGFET's according to a logic equation of minterm-type expression.

3,945,001

NUMERIC DISPLAY CONFIGURATION

George Shimakawa, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 302,335, Oct. 30, 1972, abandoned. This application Oct. 21, 1974, Ser. No. 516,713
Claims priority, application Japan, Nov. 1, 1971, 46-86204
Int. Cl.² G08B 5/36
U.S. Cl. 340—336 **8 Claims**



1. An improved numeric seven-segment display device for showing any single digit from 0 to 9, comprising a top, a right-upper, a right-lower, a left-upper, a left-lower, a middle and bottom segments, the totality of said segments forming a figure-8 with essentially vertical sides and horizontal top, middle and bottom, said bottom segment being thinner at its mid-portion than said top segment and being concave on its upper edge and convex on its lower edge, and extending at its left end into the bottom of the space normally occupied by the left-lower segment of a conventional seven-segment numeric display, said left-lower and bottom segments being mutually interposed and said bottom segment dividing said left-lower segment, said left-lower segment being in three portions, the first of said three portions extending from proximate the bottom of said left-upper segment to the left end of said bottom segment, the second of said portions having an essentially horizontal upper edge and a lower edge conforming to the upper concave edge of said bottom segment and the third of said portions lying beneath the left-hand end of said bottom segment, said second and said third portions having size, shape and position such that in combination with said bottom segment a strip is formed which has essentially the same transverse dimension as said top segment; and electric circuitry connected with said segments for selective actuation of same, said electric circuitry including electrical connections between said three portions of said left-lower segment so that said three portions are always actuated together.

3,945,002

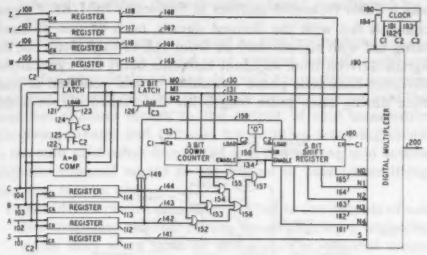
BLOCK DIGITAL PROCESSOR FOR USE WITH NONUNIFORMLY ENCODED DIGITAL WORDS

Donald Lars Duttweiler, Colts Neck, and David Gavin Messerschmitt, Matawan, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 25, 1974, Ser. No. 517,879
Int. Cl.² H03K 13/22
U.S. Cl. 340—347 DD **11 Claims**

1. Apparatus for processing previously encoded digital words each one of which includes segment bits to indicate a location in an encoding range and interval bits to indicate a location within a segment, said apparatus comprising means for storing said segment bits and said interval bits for a predetermined number of input digital words, said predetermined number being greater than one, means responsive to said segment bits for determining a maximum segment value present in said predetermined number of input digital words, means for processing the stored segment bits and interval bits for each of said input digital words to develop a processed digital word with fewer digital bits in response to a difference between the value of said stored segment bits and said maxi-

mum segment value determined for said predetermined number of input digital words, and means for transmitting a predetermined number of processed digital words with said maximum segment value corresponding to said predetermined number of processed digital words.

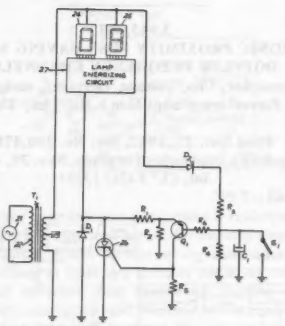


3,945,003

MULTI-LEVEL TELEVISION RECEIVER CHANNEL INDICIA DISPLAY

Arthur N. Borg, and Bruce E. Smith, both of Fort Wayne, Ind., assignors to The Magnavox Company, Fort Wayne, Ind.

Filed Apr. 23, 1974, Ser. No. 461,666
Int. Cl.² G08B 5/36
U.S. Cl. 340—377 5 Claims



1. Television channel display apparatus comprising:
a seven-segment units digit display member and a seven-segment tens digit display member, each member having seven individual illuminating segments arranged to display all ten numerals upon selective segment energization;
said selectively energized illuminating segments being connected in parallel;
an alternating current supply circuit being connected across each of said display members to energize said segments;
rectifying means being in said supply circuit to half-wave rectify the power supplied to said display members;
thyristor means connected across said rectifying means to supply full-wave power to said display means when triggered into conduction;
a triggering circuit for said thyristor means having a transistor, and an RC circuit, said transistor being biased to saturation upon discharge of the capacitor of said RC circuit to trigger said thyristor means on;
switch means to discharge said capacitor upon each channel change and;
said capacitor being connected to said power supply through the resistor of said RC circuit to become sufficiently charged after a predetermined time to bias said transistor out of saturation and turn off said thyristor means.

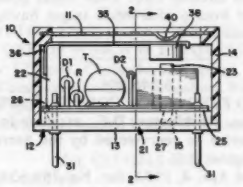
2. Television channel display apparatus comprising:
a character display device having a plurality of illuminable segments, each segment being selectively illuminable by electrical energization thereof and illuminable at different levels of illumination corresponding to different levels of energization;
means for selectively energizing said segments in combinations to display characters;
switch means;
time control means responsive to said switch means for providing a control signal for a predetermined time; and
level control means responsive to said control signal for energizing said selectively energized segments at a higher level for said predetermined time and at a lower level at other times.

3,945,004

HIGH EFFICIENCY BUZZER

John L. Myers, Dayton, Ohio, assignor to Projects Unlimited, Inc., Dayton, Ohio

Filed July 11, 1974, Ser. No. 487,716
Int. Cl.² G08B 3/10
U.S. Cl. 340—384 E 4 Claims



1. A driving arrangement for an electromagnetic oscillating member including a core member of high magnetic permeability and an armature movably mounted proximate to said core member,
a driving coil mounted to induce a magnetic flux in said core member, and an electronic oscillator circuit connected to said driving coil,
comprising a power supply,
a transistor,
said driving coil being connected in series with said power supply and the emitter-collector circuit of said transistor,
a resistor and a diode series connected to each other and to said power supply,
a control coil connected between the junction of said resistor and diode and the base of said transistor and having an impedance matched to the input impedance of said transistor,
said control coil being surrounded by said driving coil and inductively coupled to said core member,
and said oscillator circuit having a free running frequency greater than and matched to the natural mechanical vibration frequency of the armature.

3,945,005

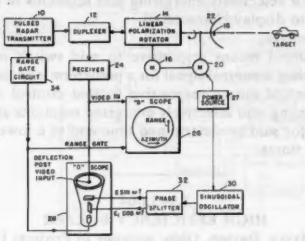
SURVEILLANCE RADAR

Ralph L. Dunn, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 31, 1961, Ser. No. 99,964
Int. Cl.² G01S 9/02
U.S. Cl. 343—5 PD 5 Claims

1. In a radar apparatus having a pulsed transmitter source of linearly polarized radio-frequency energy, a duplexer, a receiver, and a directional antenna system including a rotatable dipole antenna for radiating linearly polarized radio-frequency energy, means interconnecting said duplexer and said dipole antenna for rotating said linearly polarized energy at a

prescribed rate, means for rotating said dipole antenna in a vertical plane at said prescribed rate, a cathode ray tube indicator, means independent of said pulsed transmitter source and in circuit with said cathode ray tube indicator for generating a circular trace on the face of said cathode ray tube



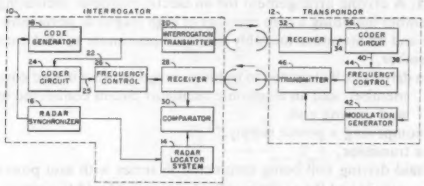
indicator, and means in circuit with said cathode ray tube indicator and responsive to the video output of said receiver for distorting the clutter pattern from natural targets along the perimeter of said circular trace when linear polarization energy is reflected from a man-made target having a defined plane of polarization.

3,945,006

RADIO FREQUENCY CODING SYSTEM

Claud E. Cleeton, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 4, 1952, Ser. No. 280,634
Int. Cl.² G01S 9/56
U.S. Cl. 343—6 R **18 Claims**



2. In combination, a radar locator system, a pulse generator operable to produce pulse transmissions comprising one or more time spaced pulses occurring in any of a plurality of fixed time positions to form a plurality of different pulse code patterns which vary from pulse transmission to pulse transmission, a receiving means for receiving each of said pulse transmissions, a coder circuit in said receiving means responsive to the number and time position of said pulses to generate a reply signal having a characteristic dependent upon the pattern of said pulse transmissions, means for synchronizing the operation of said radar locator system and said pulse generator, and means for correlating the reply signals generated in said coder circuit and the echo pulses received by said radar locator system.

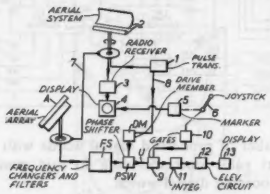
3,945,007

RADAR SYSTEMS

Matthew Frederick Radford, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Apr. 7, 1972, Ser. No. 241,997
Claims priority, application United Kingdom, Apr. 7, 1971, 8945/71
Int. Cl.² G01S 9/06
U.S. Cl. 343—6 R **5 Claims**

1. A within-pulse radar including an aerial array consisting of aerial elements so spaced from one another as substantially to satisfy the equation $\text{Sin } \theta/2 = \lambda/2Kd$; means for deriving, from the signals received upon the different elements, signals which differ from one another in frequency by $1/Kt$; K signal channels fed with the derived signals, each of said channels being fed with signals derived from $1/K$ of said elements, the signals derived from adjacent elements being fed cyclically to different channels; phase switching means actuated at least once during each pulse length for simultaneously switching



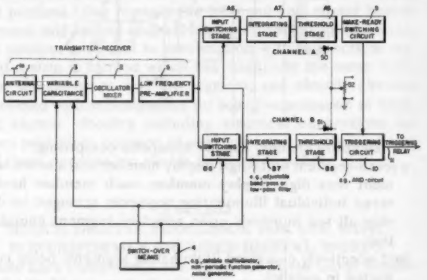
the phases of the signals in the channels in such manner that, at each switching operation, the phase in the channel switched thereby shifts by $2\pi/K$ or a multiple thereof, the shifts simultaneously produced in the different channels being different; and means for combining the signals obtained from the channels after phase switching to provide signals for utilization and target information determination: where θ is a pre-determined angle of scan, λ is the wave length, d is the element spacing, t is the pulse length, and K is an integer greater than 1.

3,945,008

ELECTRONIC PROXIMITY FUSE HAVING MULTIPLE DOPPLER FREQUENCY CHANNELS

Georg Schmucker, Ulm, Danube, Germany, assignor to Telefunken Patentverwertungs-G.m.b.H., Ulm, Danube, Germany

Filed Nov. 27, 1962, Ser. No. 240,475
Claims priority, application Germany, Nov. 29, 1961, 21209
Int. Cl.² F42C 13/04
U.S. Cl. 343—7 PF **22 Claims**



1. A Doppler frequency responsive electronic proximity fuse comprising, in combination:

a means for transmitting signals at at least two different frequencies and for receiving Doppler frequency signals which are reflected by a target;

b means forming a first amplifier channel for amplifying only those Doppler frequency signals which are received when said transmitting-receiving means transmit at one of said two different frequencies;

c means forming a second amplifier channel for amplifying only those Doppler frequency signals which are received when said transmitting-receiving means transmit at the other of said two different frequencies;

d each of said amplifier channel means including an integrating stage and a threshold stage connected to the output of said integrating stage, so that each amplifier channel means produces an output signal only when the integrated Doppler frequency signal being amplified by

the respective channel means exceeds a predetermined minimum amplitude, the integrating stage of at least one of said amplifier channel means being constituted by a filter circuit;

e switch-over means connected to said transmitting-receiving means and to said first and second amplifier channel means for alternately causing (1) said transmitting-receiving means to transmit said one frequency and connecting said first amplifier channel means to the output of said transmitting-greceiving means, and (2) said transmitting-receiving means to transmit said other frequency and connecting said second amplifier channel means to the output of said transmitting-receiving means; and

f coincidence circuit means connected to the outputs of said two amplifier channel means for producing a triggering signal only when both of said amplifier channel means apply an amplified signal to said coincidence circuit means.

3,945,009
ANTENNAE WITH LINEAR APERTURE

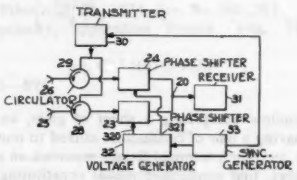
Roland Trigon, Paris, France, assignor to CSF - Compagnie Generale de Telegraphie Sans Fil, Paris, France

Filed Feb. 17, 1967, Ser. No. 618,272

Claims priority, application France, Feb. 22, 1966, 66.50605

Int. Cl.² G01S 9/42

U.S. Cl. 343—7.7 **5 Claims**



1. A reflector type antenna comprising a relfector having a linear radiating aperture and means for linearly displacing the antenna radiation phase center along said aperture, said means comprising at least two primary radiating sources illuminating said reflector, first means for feeding respective electromagnetic energy to said sources, and second means for controlling the phase-shift between the energy fed to one of said sources and that fed to the other.

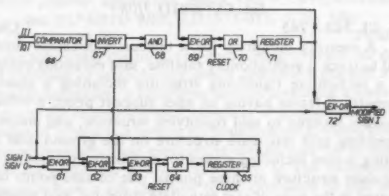
3,945,010
PULSE COMPRESSION RADAR

Brian Wardrop, Worcester, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Aug. 9, 1974, Ser. No. 496,271

Int. Cl.² G01S 9/233

U.S. Cl. 343—17.2 PC **1 Claim**



1. A bi-phase decoder comprising two phase-shift detectors each operative to measure the phase difference between each sub-pulse in a received bi-phase code relative to a respective one of two signals in phase quadrature with one another; two sampling circuits each operative to sample periodically the output of a respective one of the phase-shift detectors and to produce a first signal representative of the magnitude of the sampled output and a further signal representative of the sign of the sampled output; a combiner for combining the magnitude signals generated by the sampling circuit in such a manner as to render the sensitivity of the decoder substantially independent of the phase of the received code and an autocorrelator connected to receive the output signal of the combiner and the sign signal from one of the sampling circuits and to autocorrelate the signal from successive sub-pulses to effect pulse compression; the decoder further including signal modifying means for correcting errors in the sign signal derived from one of the sampling circuits resulting from Doppler shifting of the carrier frequency of the received bi-phase code, the signal modifying means being operative to detect such errors by detecting changes in the product of the sign signals derived from the separate sampling circuits at times when the value of the magnitude signal derived from a predetermined one of the sampling circuits is greater than the value of the magnitude signal derived from the other.

3,945,011
RADAR SYSTEM EMPLOYING CONSECUTIVE PULSES ONLY ONE OF WHICH IS FREQUENCY SWEPT

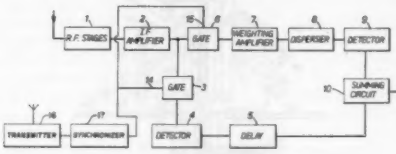
John Arthur Glasgow, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Oct. 10, 1974, Ser. No. 513,812

Claims priority, application United Kingdom, Nov. 13, 1973, 52548/73

Int. Cl.² G01S 9/233

U.S. Cl. 343—17.2 PC **7 Claims**



3. A receiver for use in a radar system in which two radar pulses are transmitted in consecutive fashion separated by a predetermined interval only one of said pulses being frequency swept, said receiver comprising a first channel means for processing non-swept pulses and providing signals indicative of targets in a first range zone, and a second channel means for processing swept pulses and providing a pulse compressed signal indicative of targets in a second range zone.

3,945,012
WIDE BAND PULSED ENERGY SYSTEM

George P. Cooper, Corona Del Mar, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 7, 1966, Ser. No. 593,237

Int. Cl.² G01S 7/28, 9/02

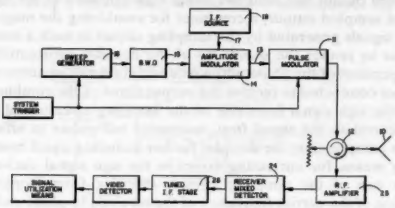
U.S. Cl. 343—17.2 R **8 Claims**

1. In a pulse-type energy system,

Means for transmitting a linearly frequency-modulated carrier wave pulse having a preselected one of a fixed frequency and chirped amplitude modulation envelope;

and

Receiving means responsive to received echoes of said



transmitted pulse for providing an output corresponding to said modulation envelope.

3,945,013

DOUBLE OMNI-DIRECTIONAL ANTENNA

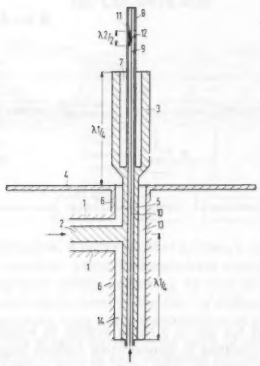
Anton Brunner, Wangen, Starnberg, and Nikolaus Willburger, Olching, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 23, 1974, Ser. No. 517,233

Claims priority, application Germany, Oct. 31, 1973, 2354550

Int. Cl.² H01Q *1/28, 1/00, 9/04, 9/38*

U.S. Cl. 343—708 **23 Claims**



1. A double omni-directional antenna for electromagnetic waves falling within two different frequency bands comprising a double coaxial line including an inner, a central and an outer conductor which in a vertical position comprise with respect to the lower of said frequency bands a lower coaxial line section as a low frequency omni-directional radiator formed by said central and said outer conductors, said central conductor being the inner conductor of said lower coaxial line section and said outer conductor being the outer conductor of said lower coaxial line section, and which for the higher of said frequency bands comprise an upper coaxial line section above said lower coaxial line section as a high frequency omni-directional radiator formed by said inner and said central conductors, said inner conductor being the inner conductor of said upper coaxial line section and said central conductor being the outer conductor of said upper coaxial line section.

3,945,014

WINDSHIELD ANTENNA WITH COUPLING NETWORK IN THE LEADIN

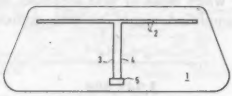
Heinz Kunert, Cologne; Heinz Moebs, Herzogenrath, and Gerd Sauer, Broichweiden, all of Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation of Ser. No. 126,627, March 22, 1971, abandoned. This application Dec. 28, 1973, Ser. No. 429,208

Claims priority, application Germany, Mar. 21, 1970, 7010571[U]

Int. Cl.² H01Q *1/32*

U.S. Cl. 343—713 **3 Claims**



1. A window comprising a sheet of glass, an elongated antenna having a pair of conductors affixed to one surface of said sheet, an output terminal fixedly mounted on said surface of said sheet, first conductive means constituting a discrete lumped electrical reactance affixed to said surface of said sheet, said first conductive means including in series an inductive reactance and a capacitive reactance, second conductive means affixed to said surface of said sheet and conductively connecting said conductors to the ends of said inductive reactance, and third conductive means affixed to said surface of said sheet and conductively connecting said capacitive reactance to said output terminal, said conductors and each of said conductive means consisting essentially of a conductive composition of silver paste baked onto said surface of said sheet.

3,945,015

SATELLITE TRACKING ANTENNA HAVING A DISH MOVEABLY SUPPORTED AT THREE POINTS

Michel Gueguen, 78160 St-Nom-la-Breteche, France

Filed Nov. 12, 1974, Ser. No. 523,149

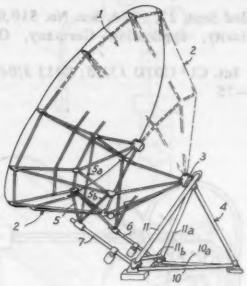
Claims priority, application France, Nov. 22, 1973, 73.41648

Int. Cl.² H01Q *3/08*

U.S. Cl. 343—765 **7 Claims**

1. A steering mounting for a telecommunication antenna used to track a geostationary satellite, said mounting comprising a recticulate rigidifying structure including a generally symmetrical frame having an apex support point, a reflector assembly secured to said rigidifying structure, and means for supporting said reticulate structure on the ground, said supporting means including means for supportingly engaging said reticulate structure at three points, one of said points being situated at the apex of said reticulate structure, said means for supportingly engaging said reticulate structure including bi-directional joint means at said apex for allowing the reticulate structure to pivot at the apex about an axis XX in azimuth and an axis YY in elevation, said axes lying orthogonally to one

another in a plane perpendicular to the axis ZZ of symmetry of the reticulate structure, and means mounting said bi-directional joint means on said supporting means for pivotal movement thereon about the axis ZZ.



3,945,016

WIDE-BAND SPIRAL ANTENNA

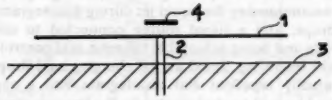
Alain Bizouard, and Jean Rannou, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 28, 1974, Ser. No. 501,201

Claims priority, application France, Aug. 31, 1973, 73.31522

Int. Cl.² H01Q 1/36

U.S. Cl. 343—895 **8 Claims**



1. A wide-band spiral antenna comprising a reflector, at least one conductive, spiral arm arranged in a plane near said reflector, and a resonator member positioned centrally and in front of said spiral arm for increasing radiation at high frequencies from an area in front of which said member is situated.

3,945,017

AUTOMATIC THERMOGRAPH

Satoshi Watanabe, and Koji Sato, both of Tokorozawa, Japan, assignors to Kabushiki Kaisha Saginomiya Seisakusho, Tokyo, Japan

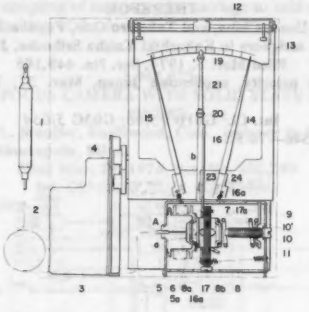
Filed Feb. 7, 1975, Ser. No. 548,059

Claims priority, application Japan, Feb. 9, 1974, 49-16004

Int. Cl.² G01D 9/00, 15/16; G01K 5/70, 5/02

U.S. Cl. 346—33 TP **2 Claims**

1. An automatic thermograph comprising a means for sensing a variation of temperature which contains a gas and a gas absorbing substance; a recording section including a converting means for converting said variation of temperature into a variation of pressure, a means for counteracting, with a predetermined pressure, said converting means and an actuating means for actuating a lever according to the variation of pressure to turn a nib attached to an extension of said lever and to record, on a sheet of chart paper continuously fed, the variation of temperature, said actuating means comprising a first means displaceable according to the variation of pressure and a second means for converting the displacement of said first means to a pivotal movement of said lever and regulating a magnitude of the pivotal movement of said lever; and a



cartridge having said sheet chart paper contained therein and being removably attached to the recording section.

3,945,018

OPTICAL INFORMATION RECORDING DEVICE

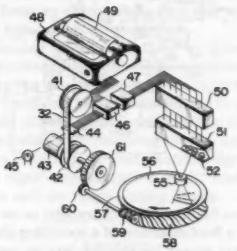
Toshitaka Suwama, and Makoto Murakoshi, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minamiashigara, Japan

Filed May 30, 1974, Ser. No. 474,763

Claims priority, application Japan, June 4, 1973, 48-62777

Int. Cl.² G01D 5/36

U.S. Cl. 346—44 **11 Claims**



1. A device for recording optical information on a photosensitive material in binary black and white patterns in accordance with digital signals recorded in a digital signal recording medium, said digital signals representing original information in the form of letters and/or figures comprising in combination:

means for reading said digital signals recorded in the digital signal recording medium and generating binary signals in accordance with the digital signals,

means for feeding a photosensitive material in synchronization with the reading of said digital signals by said reading means,

means controlled by said binary signals generated by said reading means for exposing the photosensitive material to light to record black and white patterns in accordance with the binary signals, and

means for converting said binary signals into visual information in the form of the original information connected with said reading means so that an operator can check the contents of the information actually recorded on the photosensitive material during the operation of recording.

3,945,019
APPARATUS AND METHOD FOR RECORDING CHARACTERS SO AS TO ENABLE READING THEREOF IN A FEED DIRECTION OF A RECORDING SHEET THEREFOR

Masaaki Ueno, Chiba, and Takehiro Ono, Funabashi, both of Japan, assignors to Kabushiki Kaisha Seikosha, Japan

Filed Mar. 5, 1974, Ser. No. 448,185

Claims priority, application Japan, Mar. 31, 1973, 48-36181

Int. Cl.² G01D 15/06; G03G 5/054

U.S. Cl. 346—74 ES 2 Claims

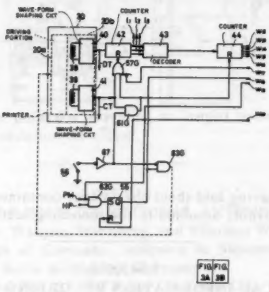


FIG. 3A

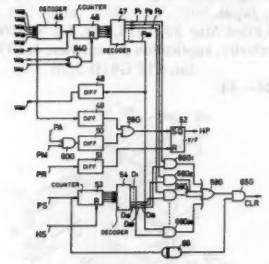


FIG. 3B

1. Apparatus for recording characters so as to enable reading thereof in a feed direction of a recording sheet comprising: refresh memory means for storing data on one picture frame to be displayed on a display screen; first storage means for storing the data derived from said refresh memory; dot-forming means for forming patterns of discrete dots on a recording sheet orthogonally to a feed direction of the recording sheet; character-generating means for converting input data thereof into dot-forming data for selectively driving said dot-forming means such that characters developed by said dot-forming means according to the dot-forming data are recorded so as to enable reading thereof in a feed direction of said recording sheet; second storage means for storing the above-mentioned converted dot-forming data derived from said character-generating means, selecting means for selecting patterns of discrete dots formed by said dot-forming means according to the dot-forming data derived from said second storage means and according to characters to be displayed on the picture frame and recorded on said recording sheet so as to enable reading thereof in a feed direction of said recording sheet, said first storage means comprising two kinds of storage means comprising one storage means for data derived from said refresh memory and corresponding to each row from among data to be displayed on one picture frame and another storage means for storing data derived from the stored data in said one storage means and corresponding to each column from among data to be displayed on the one picture frame.

3,945,020
LIQUID JET RECORDER

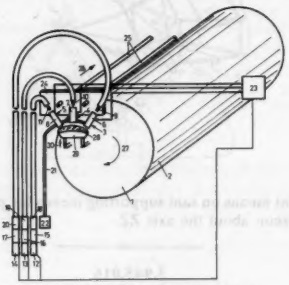
Helmut Kraus, and Walter Distler, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Sept. 27, 1974, Ser. No. 510,016

Claims priority, application Germany, Oct. 1, 1973, 2349239

Int. Cl.² G01D 15/18; B41J 3/04

U.S. Cl. 346—75 3 Claims



1. In a liquid jet recorder having at least one jet nozzle; a pressure means conduit connected to said jet nozzle for causing the latter to propel a jet of an electrically-conductive recording liquid onto a recording carrier; at least one control electrode formed of a porous material communicating with a suction conduit for aspirating said recording liquid, said electrode encompassing the liquid jet during disintegrating thereof into drops; and a signal source connected to said control electrode and being actuatable between said control electrode and said recording liquid jet for charging said drops so as to be mutually repellent and disintegrate into a vapor cloud aspirated by said control electrode, the improvement comprising: a suction pad; actuating means operatively connected to said suction pad for conveying said suction pad from an inoperative position at a distance from the jet outlet side of said control electrode into compressive engagement with said electrode jet outlet side and with a support for said electrode.

3,945,021
LIQUID JET RECORDER

Helmut Kraus, Erlangen, and Siegfried Wiesmuller, Grossgrundlach, both of Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Sept. 30, 1974, Ser. No. 511,030

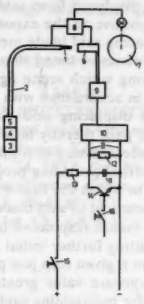
Claims priority, application Germany, Oct. 2, 1973, 2349482

Int. Cl.² G01D 15/18; B41J 3/04

U.S. Cl. 346—75 3 Claims

1. In a liquid jet recorder having at least one jet nozzle; a pressure means conduit connected to said jet nozzle for causing the latter to propel a jet of an electrically-conductive recording liquid onto a recording carrier; at least one control electrode formed of a porous material encompassing the liquid jet during disintegration thereof into drops and communicating with suction means for said recording liquid; and a signal source adapted to be applied between said control electrode and said liquid jet for charging said drops so as to mutually repel each other and disintegrate into a vapor cloud absorbed by said control electrode, the improvement comprising: said suction means including a suction pump connected to said control electrode; a control circuit connected to said suction pump for actuating said suction pump prior to com-

mencement of an image recording sequence; and delay means in said control circuit for delaying deactuation of said suction



pump subsequent to completion of an image recording sequence.

3,945,022

LIQUID JET RECORDER

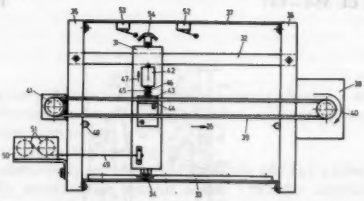
Walter Distler, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Sept. 30, 1974, Ser. No. 511,033

Claims priority, application Germany, Oct. 1, 1973, 2349307

Int. Cl.[2] G01D *15/24*; B41J *3/04*

U.S. Cl. 346—75 **2 Claims**



1. In a liquid jet recorder having at least one jet nozzle; a pressure means conduit connected to said jet nozzle for causing the latter to propel a jet of an electrically-conductive recording liquid onto a recording carrier; at least one control electrode encompassing said liquid jet disintegrating into drops; a signal source for imparting a charge to said drops for effecting mutual repelling and disintegration into a vapor cloud; means for producing relative movement between said jet nozzle and said recording carried in two mutually perpendicular directions for producing a linewise image recording; a pair of rails; a recorder carriage movable along said rails, said jet nozzle and control electrode constituting a recording unit forming a component of said recorder carriage; and an electromotor adapted to have said recorder carriage coupled thereto for conveyance thereof within a predetermined range; said recording carrier being limited to movement perpendicular to the direction of movement of said recorder carriage, the improvement comprising: a conveying belt adapted to be driven by said electromotor; an electrical coupling magnet for coupling said recorder carriage to said conveying belt, said motor driving said belt in one conveying direction into an end position of said recorder carriage; spring-loaded return means having a spring tensioned upon movement of said carriage toward the end position, said return means reconveying said recorder carriage into its initial position upon reaching the end position; means for controlling said coupling magnet so as to effect uncoupling of said recorder carriage from said conveying belt upon reaching said end position; and at least one switch for actuating said coupling magnet during reconveyance of said recorder carriage from the end position into the initial position shortly before reaching the initial position so as to effect coupling of said recorder carriage to said conveying belt for braking of the former.

3,945,023

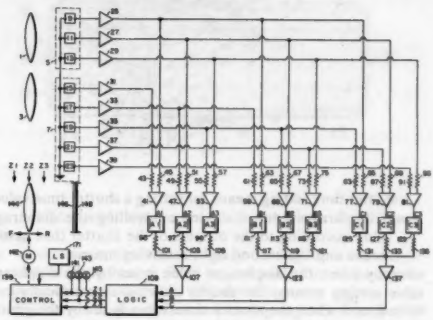
AUTO-FOCUS CAMERA WITH SOLID STATE RANGE FINDER

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 29, 1974, Ser. No. 456,289

Int. Cl.[2] G03B *13/18*; G01C *3/08*

U.S. Cl. 354—25 **9 Claims**



1. A range finding device comprising:

first and second stationary receiving means for receiving radiation from an object along first and second spatially separated light paths, respectively;

stationary sensing means arranged to provide electrical signals representative of the relative position of the intensity distribution of said radiation passing through said first stationary receiving means with respect to the position of the intensity distribution of said radiation passing through said second stationary receiving means; and

circuit means responsive to said electrical signals to provide an output signal representative of the distance between said object and the range finding device.

3,945,024

CAMERA IN WHICH THE IRIS IS SET PRIOR TO THE EXPOSURE TIME AND ADAPTABLE TO PERMIT SHUTTER TIME PRESELECTION

Goro Hasegawa, Fuchu; Soichi Nakamoto, Machida; Yoshiaki Watanabe, Fujisawa; Tetsuya Taguchi, Kawasaki, and Katuhiko Yamada, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 5, 1973, Ser. No. 376,676

Claims priority, application Japan, July 4, 1972, 47-66893

Int. Cl.[2] G03B *7/00*

U.S. Cl. 354—29 **6 Claims**

1. A camera system comprising:

a camera body having a connecting portion;

an interchangeable photographing lens mounted on the camera body;

a first finder optical system provided in the camera body and having a connecting portion on which at least part of the finder optical system is mounted on and dismounted from the connecting portion on the camera body;

first light receiving means incorporated in the camera body to receive light which has passed through a part of the first finder optical system;

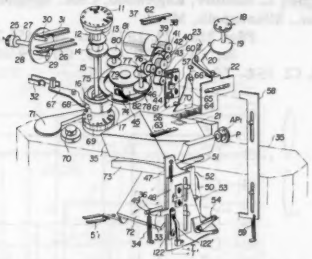
a diaphragm value setting means for setting the diaphragm value;

a shutter time control means connected to the diaphragm value setting means and selectively connected to the first light receiving means to control the shutter time; and

a diaphragm control device attachable to the connecting portion of said camera body, said diaphragm control device comprising:

a second finder optical system connectable to the first finder optical system,

a second light receiving means provided in the light path of the second finder optical system, and



a shutter time setting means for setting a shutter time value, said diaphragm control device controlling the diaphragm value according to the outputs of the shutter time setting means and the second light receiving means;

whereby when the diaphragm value is set by the diaphragm value setting means, the shutter time is automatically controlled, and when the shutter time value is set by the shutter time setting means the diaphragm value is automatically controlled.

3,945,025

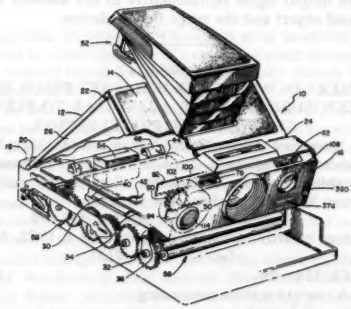
EXPOSURE CONTROL SYSTEM

John W. Stempeck, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 414,886, Nov. 12, 1973, abandoned. This application Nov. 21, 1974, Ser. No. 525,747

Int. Cl.[2] G03B *7/10, 9/42*

U.S. Cl. 354—29 **24 Claims**



1. A photographic exposure control system for a camera, the camera having means for mounting photographic material at a given focal plane, means for directing image-carrying rays from a scene along a given optical path to the camera focal plane, and selectively operable means for initiating an exposure cycle, said system comprising:

means for selecting an exposure value;

blade means;

means for mounting said blade means for displacement between a position blocking the optical path and other positions unblocking the optical path, said blade means providing progressively larger aperture values through which scene light is transmitted to the focal plane as said blade means are displaced from said blocking position;

control means responsive to the exposure initiating means for initially displacing said blade means from said blocking position in a series of timed steps to initiate an exposure interval during which scene light is directed to the focal plane and, in accordance with said exposure value, for subsequently displacing said blade means to again block the optical path thereby terminating the exposure interval, each successive step in conjunction with the time of occurrence thereof providing progressively larger step exposure values to which the film is subjected during the initial step displacement of said blade means, said control means including means responsive to said selected exposure value for halting further initial displacement of said blade means from a given step just preceding a next step having a step exposure value greater than the selected exposure value, for maintaining said blade means at said given step for an additional time after said halting which is proportional to the difference between said step exposure value of said given step and said selected value, and for subsequently displacing said blade means to block the optical path.

3,945,026

FOCAL PLANE SHUTTER

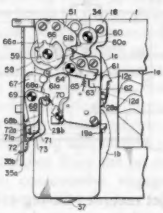
Tadao Hayami, Tokyo, Japan, assignor to Kabushiki Kaisha Koparu, Tokyo, Japan

Division of Ser. No. 294,547, Oct. 3, 1972, Pat. No. 3,825,940. This application Feb. 13, 1974, Ser. No. 441,986

Claims priority, application Japan, Oct. 6, 1971, 46-78455

Int. Cl.[2] G03B *15/04*

U.S. Cl. 354—147 **1 Claim**



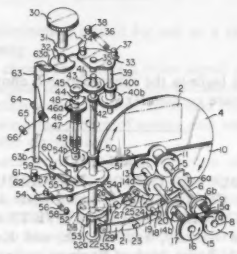
1. A focal plane shutter comprising a base plate member having an exposure aperture; an opening actuating member pivoted on said base plate member; opening shutter blades connected to said opening actuating member; an opening release lever pivoted on said base plate member and arranged so as to lock said opening actuating member in its cocked position; a release lock lever pivoted on said base plate member and engaged with said opening release lever, said release lock lever being rotated at the same time as the instant of shutter releasing and being capable of releasing said opening actuating member by moving said opening release lever in the final stage of rotation of said release lock lever; a gear governor engageable with said release lock lever and capable of delaying the motion of said release lock lever to delay the opening time of said opening shutter blades; an M-contact actuating lever pivoted on said base plate member; an M-movable contact pivoted on said base plate member and engaged with said M-contact actuating lever, said M-movable contact being moved after a constant time from shutter releasing, by the motion of said M-contact actuating lever which is released at the same time as the instant of shutter releasing; an M-stationary contact fixed to said base plate member and arranged to contact said M-movable contact when said M-movable contact is moved; a cam moved by the setting operation of the

exposure time; and a synchro-lever pivoted on the base plate member and engageable with said cam and gear governor, whereby the moving range of said gear governor is adjusted by said cam.

3,945,027
ROTARY SHUTTER MECHANISM

Shuji Kimura, Tokyo, and Sachio Ohmori, Yokohama, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 24, 1974, Ser. No. 436,171
Claims priority, application Japan, Jan. 26, 1973, 48-10772; May 31, 1973, 48-63371[U]
Int. Cl.² G03B 9/16
U.S. Cl. 354—250 **6 Claims**



1. A rotary shutter mechanism for a camera having a winding mechanism and a release mechanism, said rotary shutter mechanism comprising:

a. a picture-taking opening (2);

b. a substantially semicircular first sector (4) and a substantially semicircular second sector (10) for alternately covering said opening;

c. first (5–9) and second (13–17) drive means charged by winding said winding mechanism to rotate said first and second sectors 180° only in one direction;

d. first restraining means (18, 21, 6*a*) normally restraining said first sector in its first position for covering said opening and in its second position which is 180° out of phase with respect to the first position;

e. second restraining means (24, 26, 14*a*) normally restraining said second sector in its first position for covering said opening and in its second position which is 180° out of phase with respect to the first position;

f. first stop means (6*b*, 7*a*) for stopping said first sector in its first and second positions during each complete rotation thereof;

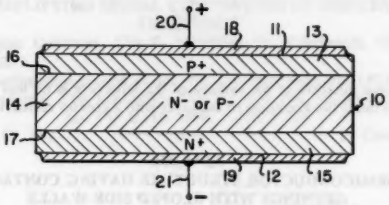
g. second stop means (14*b*, 15*a*) for stopping said second sector in its first and second positions during each complete rotation thereof; and

h. control means operatively associated with said release mechanism to control said first and second restraining means so that upon release mechanism one of said two restraining means is released from its normal position restraining one of said sectors in its first position to permit rotation of said one sector until its stoppage in second position by one of said two stop means, and after predetermined time delay, the other restraining means is released from its normal position restraining the other sector in its second position to permit rotation of said other sector until its stoppage in its first position by the other stop means.

3,945,028
HIGH SPEED, HIGH POWER PLASMA THYRISTOR CIRCUIT

Surinder Krishna, Ballston Lake, N.Y., and Chang Kwei Chu, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 26, 1973, Ser. No. 354,580
The portion of the term of this patent subsequent to Aug. 13, 1991, has been disclaimed.
Int. Cl.² H01L 29/90
U.S. Cl. 357—13 **4 Claims**



1. A high speed, high power plasma thyristor circuit comprising:

a. a silicon semiconductor body having opposed major surfaces and having first, second and third impurity regions therein; said first and third impurity regions each adjoining a major surface and having opposite conductivity-type; said second impurity region being within the body between said first and third impurity regions and having a width of at least 80 microns and an impurity concentration therethrough of less than about 5×10^{14} atoms/cm^3; and a PN junction being in the body at a transition between said regions, and having a reverse breakdown voltage between about 1.4 and 3.3 times greater than the punch-through voltage of the second impurity region;

b. electrical contacts affixed to the major surfaces to make ohmic contact with said first and third impurity regions;

c. a bias power source electrically connected to the electrical contacts and capable of applying a reverse bias voltage across the body greater than the punch-through voltage of said second impurity region but less than the reverse breakdown voltage of the PN junction; and

d. a control power source electrically connected to the electrical contacts and capable of causing a current pulse through the body having a density greater than the saturation current density of the second impurity region.

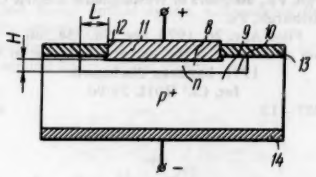
3,945,029
SEMICONDUCTOR DIODE WITH LAYERS OF DIFFERENT BUT RELATED RESISTIVITIES

Sergei Fedorovich Kausov, Scherbakovskaya ulitsa, 57/20, kv. 178, Moscow, U.S.S.R.

Filed Mar. 19, 1974, Ser. No. 453,003
Int. Cl.² H01L 29/92
U.S. Cl. 357—14 **6 Claims**

1. A semiconductor diode comprising two layers of opposite types of conductivity constituting a semiconductor structure, said layers forming a semiconductor junction therebetween and having substantially different resistivity, the layer with greater resistivity having a thickness no greater than that of the space charge produced as a result of application to said structure of a reverse bias voltage which is less than the puncture voltage of said semiconductor junction, ohmic contacts respectively adjoining said layers and adapted to apply supply voltage to said structure, said ohmic contacts having respective edges, said semiconductor junction emerging at the surface of said structure, the ohmic contact adjacent the layer

with greater resistivity being arranged so that the distance between its edge and the place of emergence of the semiconductor junction at the surface of the structure is no less than two times the thickness of the layer with a greater resistivity.



3,945,030

SEMICONDUCTOR STRUCTURE HAVING CONTACT OPENINGS WITH SLOPED SIDE WALLS

Alan Seales, San Jose, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Division of Ser. No. 323,904, Jan. 15, 1973, Pat. No. 3,842,490, which is a continuation of Ser. No. 135,893, April 21, 1971, abandoned. This application May 17, 1974, Ser. No. 470,938

Int. Cl.² H01L 29/34

U.S. Cl. 357—52 **16 Claims**

1. In a semiconductor structure, a semiconductor body having a planar surface, at least one region having an impurity therein formed in said body and defined by a PN junction extending to said surface, a layer of insulating material formed on said surface and covering said junction, said layer of insulating material having an opening therein and exposing said surface in an area overlying said region, said opening being defined exclusively by planar inclined side walls in said layer of insulating material having a positive slope extending at an angle of less than 70° with respect to said surface, and contact means carried by said semiconductor body and extending through said opening to contact said region and completely covering said surface and said inclined side walls and, having a slope in the opening which does not differ significantly from the slope of the inclined side walls to provide a contact which is substantially free of cracks.

3,945,031

CHARGE EFFECTS IN DOPED SILICON DIOXIDE

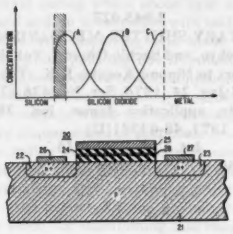
Dawon Kahng, Bridgewater, and Joseph Raymond Ligenza, Califon, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 423,289, Dec. 10, 1973, abandoned. This application July 7, 1975, Ser. No. 593,696

Int. Cl.² H01L 29/78, 29/34

U.S. Cl. 357—23 **12 Claims**

1. A semiconductor device comprising a silicon semiconductor substrate of a first conductivity type, a pair of spaced impurity zones of a second conductivity type formed into the substrate, a layer of silicon dioxide contacting the substrate and overlying the space between the impurity zones, a layer of metal contacting the silicon dioxide layer, and having a distribution of tantalum in one of its oxidation states in the silicon dioxide layer, said distribution characterized by a peak in the silicon dioxide layer and by a concentration of tantalum in the silicon dioxide layer in the range between about 10^{13} and 1.5×10^{15} per square centimeter.



3,945,032

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING A CONDUCTIVE PLANE AND A DIFFUSED NETWORK OF CONDUCTIVE TRACKS

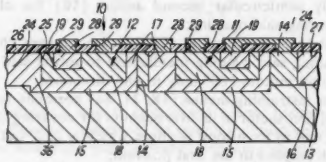
David Latham Grundy, Saddleworth, and Kenneth Lawson Hughes, Hale Barns, both of England, assignors to Ferranti Limited, Hollinwood, England

Continuation of Ser. No. 359,597, May 11, 1973, abandoned. This application Jan. 21, 1975, Ser. No. 542,674

Claims priority, application United Kingdom, May 30, 1972, 25168/72

Int. Cl.² H01L 27/02

U.S. Cl. 357—40 **10 Claims**

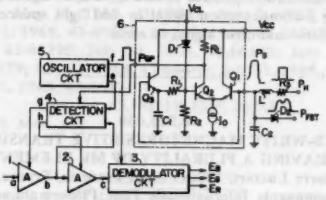


1. A semiconductor device having a plurality of constituent components, a plurality of different possible metallisation patterns of conductors for interconnecting said components in a desired functional circuit arrangement, a semiconductor body having a substrate of one conductivity type forming a conductive plane in the device, an epitaxial layer on the substrate of the same conductivity type including a plurality of diffused regions of opposite type including a plurality of diffused regions of opposite conductivity type and a plurality of unmodified regions forming the constituent components of the device, a diffused network of conductive tracks of said opposite conductivity type, said diffused network of conductive tracks being remote from the conductive plane and said metallisation patterns of conductors being disposed on said epitaxial layer and being connected to the conductive plane via at least one unmodified region and to the components and the conductive tracks to form the desired functional circuit arrangement.

3,945,033
COLOR ELIMINATING CIRCUIT

Yozo Tanihara, Kodaira, and Masayasu Niimi, Hiroshima, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 10, 1974, Ser. No. 432,179
Claims priority, application Japan, Jan. 10, 1973, 48-5238
Int. Cl.² H04N 9/49
U.S. Cl. 358—26 13 Claims



1. A color eliminating circuit for use in a color television system comprising:

an amplifier circuit for gating a color signal and subjecting the color signal to controlled amplification;

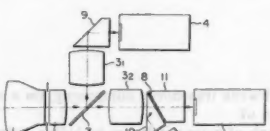
a killer detection circuit, connected to said amplifier circuit, for controlling the action of gating and amplification of said amplifier circuit; and

means, connected to said killer detection circuit and responsive to the level of a received color signal, for causing said killer detection circuit to cut-off the operation of said amplifier circuit when either the level of a received color signal fails to exceed a prescribed level or in the absence of receiving a color signal and the killer detection output of said killer detection circuit exceeds a prescribed operating voltage of said amplifier circuit.

3,945,034
OPTICAL SYSTEM FOR A COLOR TELEVISION CAMERA

Michiko Suzuki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 463,244, April 23, 1974, abandoned. This application Apr. 30, 1975, Ser. No. 573,587
Claims priority, application Japan, Apr. 26, 1973, 48-46701
Int. Cl.² H04N 9/09
U.S. Cl. 358—50 1 Claim



1. An optical system for color television camera which comprises in combination:

a. an objective zoom lens composed of a zooming section and a relaying section, wherein said zooming section has a negative Petzval's sum, and said relaying section has a positve Petzval's sum, and includes a front group of a positive refractive power and a first rear group of a positive refractive power, reflectively manner and the other light component light in a transmitting manner, said transmittingly separated light being directed to said first rear group;

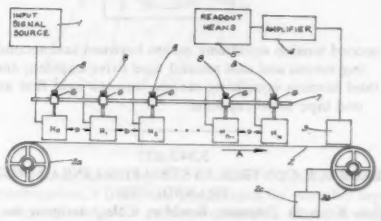
b. a second rear group of a positive refractive power, to which said reflexively separated light component by said first color resolving filter is directed, a monochromatic image being formed on a pick-up tube by said second rear group; and

c. a second light resolving filter disposed after said first rear group of said relaying section, and which resolves further the light transmitted through said first light resolving filter into two light component lights, each of said further resolved light component lights forming a monochromatic image on each of second and third pick-up tubes.

3,945,035
METHOD AND MEANS FOR FILTERING AND AMPLIFYING SIGNAL COMPONENTS OF DESIRED FREQUENCY

Douglas Goldman, 170 E. McMillan St., Cincinnati, Ohio 45219

Continuation-in-part of Ser. No. 291,979, Sept. 25, 1972, abandoned. This application May 8, 1974, Ser. No. 467,853
Int. Cl.² G11B 5/09, 27/10, 27/28
U.S. Cl. 360—7 17 Claims



1. A system for intensifying a desired component of a recurring signal comprising a plurality of signal recording elements arranged in sequence, means to combine the recording of said elements, the recording of each element being simultaneous with respect to the recording of the other recording elements of said sequence and intensifying by summation only said desired component while continuously reflecting changes therein from cycle to cycle.

3,945,036
INFORMATION RECORDING TRANSPORT WITH TAPE TENSION EQUALIZATION BETWEEN DISTINCT CAPSTANS

Irving Karsh, Los Angeles, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Aug. 21, 1974, Ser. No. 499,365
Int. Cl.² G11B 15/43, 15/29; B65H 17/42, 17/50
U.S. Cl. 360—71 24 Claims

1. An information recording tape transport comprising in combination:

first winding means for selectively winding and unwinding information recording tape;

second winding spaced from said first winding means for selectively winding and unwinding information recording tape;

first driving means including a first tape drive capstan for driving information recording tape between said first and second winding means;

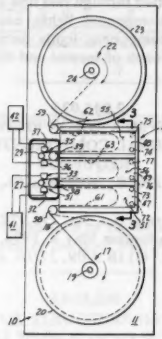
second driving means distinct from said first driving means and including a second tape drive capstan for driving information recording tape between said first and second winding means;

first transducer means located adjacent said first tape drive capstan for transducing information relative to information recording tape;

second transducer means located adjacent said second tape drive capstan for transducing information relative to information recording tape; and

means for applying recording tape to said first and second transducer means at controlled tension, comprising:

first tension equalizing means between said first winding means and said first tape drive capstan;



second tension equalizing means between said second winding means and said second tape drive capstan; and

third tension equalizing means between said first and second tape drive capstans.

3,945,037

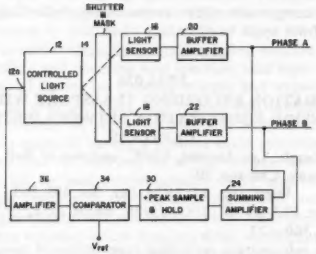
FEEDBACK CONTROL SYSTEM FOR LINEAR POSITION TRANSDUCER

Albin Kenneth Johnson, Boulder, Colo., assignor to Iomec, Inc., Santa Clara, Calif.

Continuation of Ser. No. 258,779, June 1, 1972, abandoned. This application Jan. 10, 1974, Ser. No. 433,020

Int. Cl.² G11B 21/10

U.S. Cl. 360—77 **8 Claims**



1. In a linear motion position transducer of the type having a light source with a selectively variable energizing input, a spaced pair of photosensitive devices, and a shuttering mechanism interposed therebetween for modulating the light received by said photosensitive devices, said photosensitive devices generating position information output signals in response to the light modulation, the output signals from one of said photosensitive devices being phase displaced from the output signals from the other one of said photosensitive devices by a phase angle ϕ in the range $0<\phi<180°$, the improvement comprising a feedback control system for electronically correcting for variation in the light parameters of said position transducer, said feedback control system including:

summing circuit means coupled to said photosensitive devices and responsive to said position information output signals for continuously algebraically summing the instantaneous values thereof to produce a combined output signal having a variable amplitude;

comparator circuit means coupled to said summing circuit means and responsive to said combined output signal for sampling the peak positive value thereof and for generating an error signal representative of the difference between said peak positive value and a reference signal having a preselected value representative of a desired value of said light parameters; and

correction circuit means coupled to said comparator circuit means and responsive to said difference signal for applying a compensation signal to said light source input to reduce said error signal to zero.

3,945,038

READ-WRITE MAGNETORESISTIVE TRANSDUCER HAVING A PLURALITY OF MR ELEMENTS

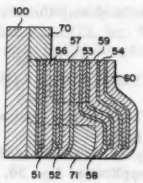
Jean-Pierre Lazzari, Villiers Saint Frederic, France, assignor to Compagnie Internationale Pour l'Informatique, Louveciennes, France

Continuation-in-part of Ser. No. 315,476, Dec. 15, 1972, Pat. No. 3,848,217. This application Aug. 2, 1974, Ser. No. 494,177

Claims priority, application France, Dec. 22, 1971, 71.46103

Int. Cl.² G11B 5/12, 5/30; H01C 7/16; G01R 33/02

U.S. Cl. 360—113 **3 Claims**



1. A read-write transducer comprising, on a substrate, the combination of:

a first stack of magnetic layers including at least two magnetoresistive layers and at least three thicker high permeability layers, each magnetoresistive layer being disposed between two of said thicker layers;

a second stack having the same number. and relative arrangement of magnetic layers as said first stack;

both stacks having rear parts contacting one another and having front parts spaced apart, forming a magnetic airgap therebetween;

a flat conductor coil having a front branch within said magnetic airgap and other branches extending from opposite ends of said front branch along the sides of said stacks and joined by a rear branch on said rear part of said stacks;

said magnetoresistive layers in said stacks being electrically interconnected, each of said magnetoresistive layers being of anisotropic material having an easy axis of magnetization at substantially 45° to the direction of electrical current flow therethrough.

3,945,039

MAGNETIC RECORDING AND REPRODUCING APPARATUS

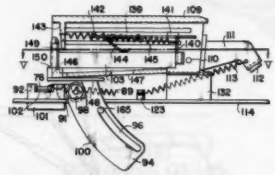
Tetsuji Yoshii, Neyagawa, Japan, assignor to Matsushita Electric Industrial Company, Ltd., Osaka, Japan

Division of Ser. No. 337,008, March 1, 1973, which is a division of Ser. No. 802,455, Feb. 26, 1969, Pat. No. 3,759,529. This application Nov. 27, 1974, Ser. No. 527,806

Claims priority, application Japan, Mar. 14, 1968, 43-16991; May 27, 1968, 43-19923; Apr. 3, 1968, 43-22477; July 11, 1968, 43-49451; Aug. 7, 1968, 43-56605; Aug. 21, 1968, 43-60295; July 30, 1968, 43-66178; July 30, 1969, 44-66179; July 31, 1968, 43-66445; July 31, 1968, 43-66446; July 31, 1968, 43-66471

Int. Cl.[2] G11B *3/08, 23/04*

U.S. Cl. 360—137 4 Claims



1. A magnetic recording and reproducing apparatus comprising mounting means for mounting a tape cassette in a playing position wherein said mounting means is provided with a cassette holding case for holding a tape cassette therein, said cassette holding case comprising a space for holding the cassette, said space being defined by guides and engaging pawls provided on both sides of said guides, an opening for inserting the cassette into said holding space along said guides, first spring actuated means adapted to be engaged with one edge of the inserted cassette mounted in said holding space towards said opening, said engaging pawls being adapted to be engaged with an edge of the inserted cassette opposite to said one edge in order to hold the inserted cassette within said space against the urging of said first spring actuated means, further spring actuated means for urging said inserted cassette against said guides, thereby preventing said cassette from being disengaged from said engaging pawls, said cassette holding case being movably supported on said base plate for the mounting and demounting operation of said cassette.

3,945,040

PUSH-PUSH LOCKING AND RELEASE MECHANISM FOR TAPE CARTRIDGE PLAYERS

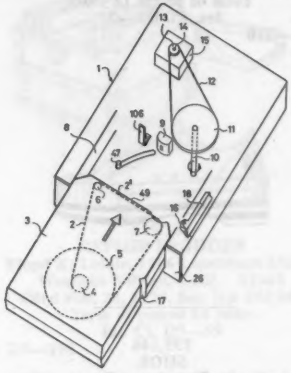
Marcel Jules Helene Staar, Brussels, Belgium, assignor to Staar Development Company, S.A., Brussels, Belgium

Filed Jan. 29, 1975, Ser. No. 545,197

Claims priority, application Belgium, Feb. 15, 1974, 811065

Int. Cl.[2] G11B *15/24;* B65H *17/48*

U.S. Cl. 360—137 12 Claims

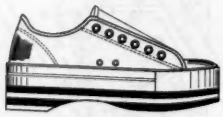


1. A tape deck locking and release mechanism comprising, in combination, a frame carrying means for movably supporting a tape cartridge for movement into the frame toward and beyond a playback position in response to a manual insertion and push, a spring for imparting return movement to the cartridge, a locking member associated with the cartridge, a locking assembly carried by the frame for catching said locking member to lock said cartridge in the playback position when the cartridge is inserted and pushed beyond said playback position and returned by said return spring therefrom, means on said element cooperating with means on said member for releasing said locking member and unlocking the cartridge when the cartridge is manually pushed beyond said playback position from its locked playback position, and for enabling said return spring to eject said cartridge out of the frame.

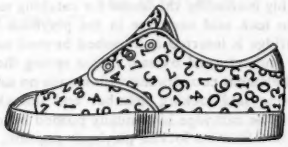
DESIGNS

MARCH 16, 1976

239,145
SHOE
Thomas G. Fisher, 129 Ohio Ave., Madison, Wis. 53704
Filed Apr. 24, 1974, Ser. No. 463,809
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310

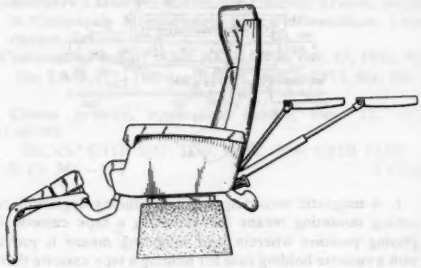


239,146
SHOE
Donna L. Gavin, Waterbury, Conn., assignor to Uniroyal, Inc.
Filed July 15, 1974, Ser. No. 488,890
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310

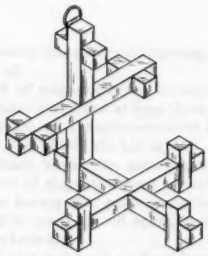


239,147
SELF-STICKING POCKET CLIP
Ralph N. Karlsen, Warroad, Minn. 56763
Filed May 2, 1974, Ser. No. 466,147
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—428

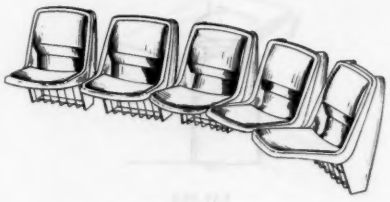
239,148
DUAL RAILROAD PASSENGER SEAT
Harry Mendell Smith and Clarence Joel Skinner, Colorado Springs, Colo., assignors to Aircraft Mechanics, Inc., Colorado Springs, Colo.
Filed Jan. 2, 1974, Ser. No. 429,513
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—48



239,149
FLOWERPOT HOLDER
Marianne Hussey, 189 Arkansas, San Francisco, Calif. 94107
Filed July 18, 1974, Ser. No. 489,776
Term of patent 7 years
Int. Cl. D11—*02*
U.S. Cl. D6—137



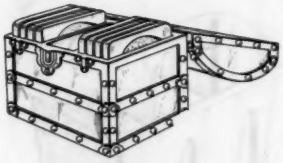
239,150
BOWLING LANE MULTIPLE SEATING UNIT
Thomas A. Meade, Huntington, N.Y., assignor to AMF Incorporated, White Plains, N.Y.
Filed Jan. 24, 1974, Ser. No. 436,058
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—197



239,151
DRINKING GLASS
Arne Lundin, Halmstad, Sweden, assignor to Duni Bila AB, Halmstad, Sweden
Filed Mar. 11, 1974, Ser. No. 450,183
Claims priority, application Sweden Sept. 11, 1973
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—6

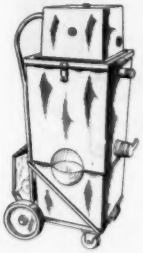
239,152
CUP
Marilyn D. Gerling, 5362 Chestnut Ridge Road, Orchard Park, N.Y. 14127
Filed July 10, 1974, Ser. No. 487,311
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—6

239,153
COASTER CHEST
Jeffrey Snyder, 5225 Collins Ave., Miami Beach, Fla. 32935
Filed Nov. 15, 1973, Ser. No. 416,270
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—45

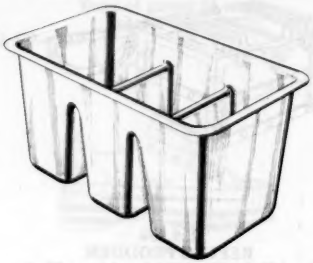


239,154
REFUSE PRODDER
Floyd K. Liddle, 1186 Landsburn Circle, Westlake Village, Calif. 91361
Filed Feb. 24, 1975, Ser. No. 552,060
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—161

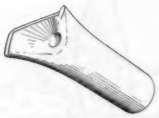
239,155
TANK UNIT FOR A STEAM CARPET CLEANING MACHINE
Jerry R. Kent, Fresno, and Willie D. Kent, Clovis, Calif., assignors to Rug Doctor Inc.
Filed Oct. 29, 1973, Ser. No. 410,972
Term of patent 14 years
Int. Cl. D7—*05;* D15—*05*
U.S. Cl. D7—166



239,156
COMPARTMENTED WASTEBASKET
Suellen C. McDonough, 16 Meserve Road, Durham, N.H. 03824
Filed Dec. 4, 1974, Ser. No. 529,371
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—187



239,157
EXTRUSION HEAD FOR CAULKING GUN
Clifford B. Archer, 5563 E. Dakota, Fresno, Calif. 93727
Filed Jan. 23, 1975, Ser. No. 543,254
Term of patent 7 years
Int. Cl. D8—*05*
U.S. Cl. D8—14.1

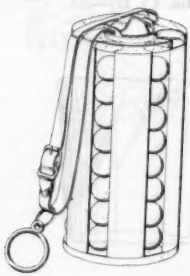


239,158
CARRYING CASE HANDLE
George W. Bush, Haddonfield, N.J., assignor to P.H.C. Industries, Inc., Camden, N.J.
Original design application Nov. 8, 1973, Ser. No. 321,812, now Patent No. 235,730. Divided and this application Nov. 12, 1974, Ser. No. 523,101
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—154

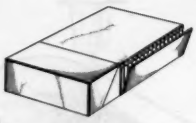
239,159
BOTTLE OR THE LIKE
Stanley Herbert Picker, Kingston Hill, England, assignor to Mary Quant Cosmetics Limited, Surbiton, England
Filed Sept. 24, 1973, Ser. No. 400,029
Claims priority, application Great Britain Mar. 30, 1973
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—169

239,160
DISPLAY CONTAINER
Bernard Giberstein, Paris, France, assignor to Rosy, Paris, France
Filed Oct. 26, 1973, Ser. No. 410,259
Claims priority, application France July 6, 1973
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—182

239,161
PACKAGE OF MARBLES
Robert Ayoub and Raymond Ayoub, both of 12 bis, Avenue Jean Perrot 38100, Grenoble, Isere, France
Filed Dec. 7, 1973, Ser. No. 422,764
Claims priority, application France July 6, 1973
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—184

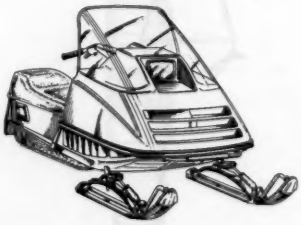


239,162
COMBINED CIGARETTE BOX AND MATCH PACKAGE
Masamitsu Ishihara, 628 Hirai, Kannami-cho, Tagata-gun, Shizuoka-ken, Japan
Filed Mar. 15, 1973, Ser. No. 341,582
Term of patent 14 years
Int. Cl. D9—*193*
U.S. Cl. D9—193

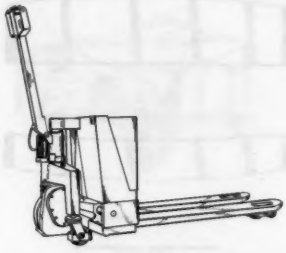


239,163
FRAGRANCE DISPENSER
Harry S. Dearling, 25 E. 83rd St., New York, N.Y. 10028
Filed Sept. 6, 1974, Ser. No. 503,629
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

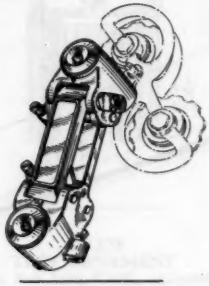
239,164
SNOWMOBILE
Douglas W. Smith, Valcourt, Quebec, and Y. Anselme Lapointe, Sherbrooke, Quebec, Canada, assignors to Bombardier Limited, Valcourt, Quebec, Canada
Filed Aug. 29, 1974, Ser. No. 501,756
Claims priority, application Canada May 29, 1974
Term of patent 7 years
Int. Cl. D12—*14*
U.S. Cl. D12—7



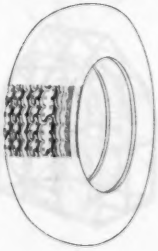
239,165
INDUSTRIAL TRUCK
Rune G Mono, Taby, Sweden
Filed Sept. 6, 1973, Ser. No. 394,669
Claims priority, application Sweden Mar. 14, 1973
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—57



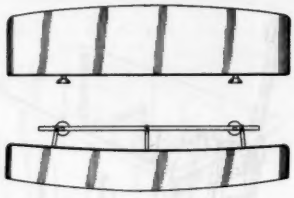
239,166
REAR DERAILLEUR BODY
Lucien Charles Hippolyte Juy, Rue de la Breuchilliere, Zone Industrielle Nord, 21003 Dijon, France
Filed Aug. 13, 1973, Ser. No. 387,810
Claims priority, application France Feb. 22, 1973
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—124



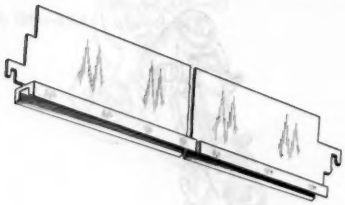
239,167
TIRE
Roland Martinet, Colombes, France, assignor to Pneumatiques Caoutchouc Manufacture et Plastiques Kleber Colombes
Filed Jan. 13, 1975, Ser. No. 540,343
Claims priority, application France Sept. 26, 1974
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



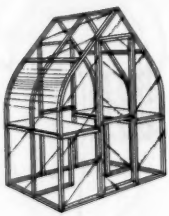
239,168
VEHICLE WIND DEFLECTOR
Donald G. Hart, R.R. 1, Geneseo, Ill. 61254
Filed Dec. 7, 1973, Ser. No. 422,658
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181



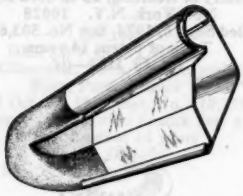
239,169
CEILING RUNNER
Louis C. Sudheimer, St. Paul, and Thomas A. Koenig, Stillwater, Minn., assignors to Conwed Corporation, St. Paul, Minn.
Filed Aug. 13, 1973, Ser. No. 388,044
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 H



239,170
PORTABLE GREENHOUSE
Borg Hansen, 1568 Elsley Ave., and John P. Myers, 422 Lomond Ave., both of West Los Angeles, Calif. 90024
Filed Feb. 26, 1973, Ser. No. 336,091
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 R



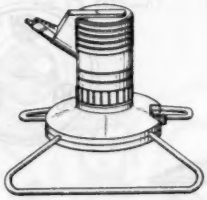
239,171
HANDRAIL WITH END PIECE
Edward C. Hallock, Summit, N.J., assignor to Construction Specialties, Inc.
Filed May 17, 1973, Ser. No. 361,054
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—7 R



239,172
COMBINATION PUMP AND TANK FOR PORTABLE SPRAYER
Fernand Berthoud, 69220 Belleville-sur-Saone, France
Filed May 24, 1974, Ser. No. 472,951
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—2

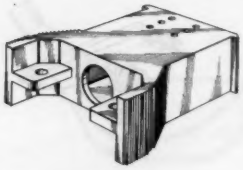
239,173
COMBINED LAMP AND FILTER FOR FISH BREEDING PONDS
Norio Yoshihara, 945 Ohaza-Angyoryo Negishi, Kawaguchi, Saitama, Japan
Filed May 28, 1974, Ser. No. 474,109
Term of patent 14 years
Int. Cl. D23--*01*
U.S. Cl. D23—4

239,174
LAWN SPRINKLER
Dieter Raffler and Franco Clivio, Ulm, West Germany, assignors to Gardena Kress + Kastner GmbH
Filed Apr. 3, 1974, Ser. No. 457,714
Claims priority, application Germany Oct. 8, 1973
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—7

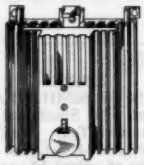


239,175
ELECTRICAL CONNECTOR
Leon Mouttet, Lonay, Switzerland
Filed Mar. 20, 1972, Ser. No. 236,541
Claims priority, application Switzerland Sept. 21, 1971
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A

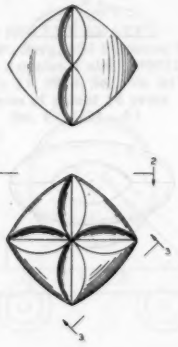
239,176
HOUSING FOR ELECTRICAL CONNECTORS
Lester E. Wilson, 1 Short St., Bedford, Mass. 01730, and Stephen Anthony Machcinski III, 19 Seymour St., Winthrop, Mass. 02152
Filed Feb. 12, 1975, Ser. No. 549,451
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A



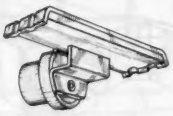
239,177
COMBINED PROGRAMMABLE CONTROLLER AND POWER SUPPLY THEREFOR
Robert J. Mauceri, North Reading, and Charles F. Middleton, Jr., Sudbury, Mass., assignors to Modicon Corporation, Andover, Mass.
Filed Apr. 23, 1974, Ser. No. 463,258
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

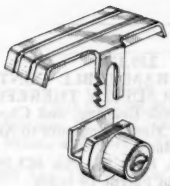


239,178
TREE ORNAMENT
Roger L. Martin, San Jose, Calif., assignor to Container Corporation of America, Chicago, Ill.
Filed Mar. 8, 1974, Ser. No. 449,360
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—1 A

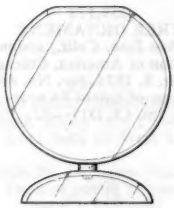


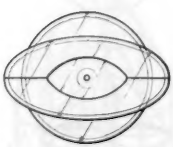
239,179
TELEPHONE LOCK
Terry M. Haber, 3050 S. Bristol, Apt. 8-C, Santa Ana, Calif. 92707
Filed Dec. 9, 1974, Ser. No. 530,525
Term of patent 14 years
Int. Cl. D8—*07;* D14—*03*
U.S. Cl. D26—14 A



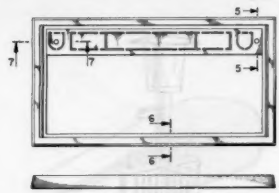


239,180
AQUARIUM OR SIMILAR ARTICLE
Tony Robert, 5701 Southwest Freeway, Houston, Tex. 77027
Filed May 1, 1974, Ser. No. 465,816
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—8

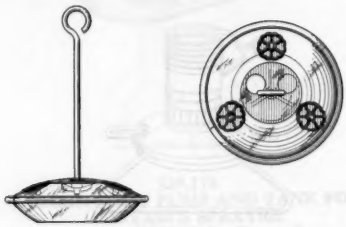




239,181
TOP FRAME FOR AN AQUARIUM
Robert R. Greenwald, 18901 Lahey St., Northridge, Calif. 91324
Filed Aug. 12, 1974, Ser. No. 496,595
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—12



239,182
HUMMINGBIRD FEEDER
Peter Kilham, Barrington, R.I., assignor to Droll Yankees, Inc., Foster, R.I.
Filed Feb. 4, 1974, Ser. No. 439,594
Term of patent 14 years
The term of this patent subsequent to Mar. 25, 1989, has been disclaimed
Int. Cl. D30—*03*
U.S. Cl. D30—13

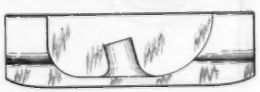


239,183
DOLL
Zula B. Cox, Rte. 1, Box 5A, Folsom, La. 70436
Filed Oct. 26, 1973, Ser. No. 410,286
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

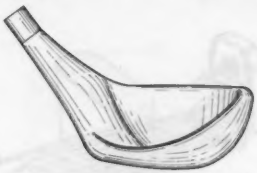
239,184
DOLL
Zula B. Cox, Rte. 1, Box 5A, Folsom, La. 70436
Filed Oct. 26, 1973, Ser. No. 410,287
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

239,185
DOLL
Zula B. Cox, Rte. 1, Box 5A, Folsom, La. 70436
Filed Oct. 26, 1973, Ser. No. 410,288
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

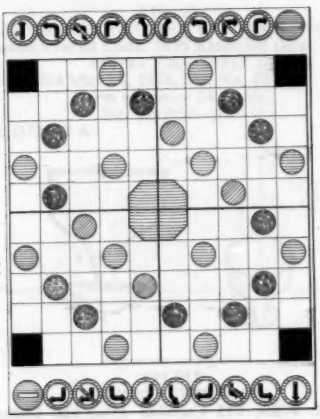
239,186
GOLF PUTTER HEAD
Ivan M. Meissler, 82 Homer St., Providence, R.I. 02905
Filed Mar. 19, 1974, Ser. No. 452,541
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



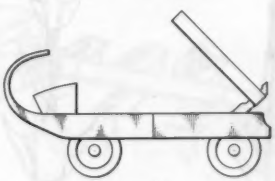
239,187
GOLF CLUB HEAD
Harold J. Smith, Greenville, R.I., assignor to American Perma-Cast, Inc., South Attleboro, Mass.
Filed Apr. 22, 1974, Ser. No. 463,189
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



239,188
GAME BOARD
Gaston D. Hoeffel, 3706 Bradley Lane, Chevy Chase, Md. 20016, and Phaon B. Derr III, Washington, D.C.; said Derr assignor to said Hoeffel
Filed Nov. 27, 1973, Ser. No. 419,229
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS

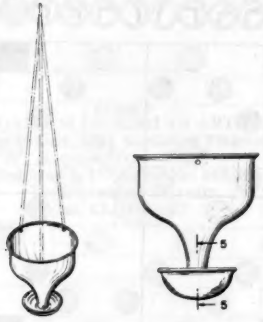


239,189
ROLLER SKATE
Raymond W. Berg, 854 Figueroa Terrace, Los Angeles, Calif. 90012
Filed July 11, 1974, Ser. No. 487,579
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 C



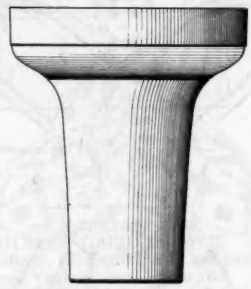
239,190
SKI BINDING
Burton A. Weinstein, New York, and Gordon C. Lipe, Skaneateles, N.Y., assignors to National Recreation Industries, Inc.
Filed May 20, 1974, Ser. No. 471,667
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 D

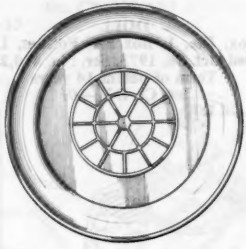
239,191
HANGING PLANTER
Janet M. Weiss, P.O. Box 2, Fort Bragg, Calif. 95437
Filed Nov. 1, 1974, Ser. No. 519,894
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A



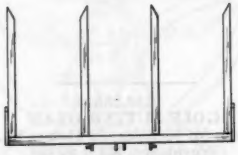
239,192
HANGING PLANTER
Bennie M. Wiles, 115 Carolina Ave., and Clarence P. Harris, Jr., P.O. Box 1597, both of Burlington, N.C. 27215
Filed Nov. 25, 1974, Ser. No. 526,623
Term of patent 14 years
Int. Cl. D6—*04;* D11—*02*
U.S. Cl. D35—3 A

239,193
FLOWER VASE
Robert H. C. M. Daenen, Erembodegem, and Pieter K. J. De Coster, Aalst, Belgium, assignors to Dart Industries Inc., Los Angeles, Calif.
Filed July 29, 1974, Ser. No. 492,803
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 R





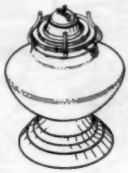
239,194
BALE CARRIER ATTACHMENT FOR TRACTORS
Norbert R. Borcherding, Box 128, Garnavillo, Iowa 52049
Filed Jan. 23, 1975, Ser. No. 543,349
Term of patent 14 years
Int. Cl. D12—*09;* D15—*03*
U.S. Cl. D40—5



239,195
ACCESSORY FOR CONVERTING BROOCH TO PENDANT
Joseph M. Aquilino, East Providence, R.I., assignor to DaVinci Creations, Inc., Providence, R.I.
Filed June 17, 1974, Ser. No. 480,208
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—1 R

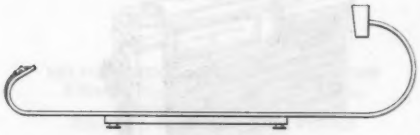
239,196
LAMP
James T. Poston, 8109 Clover Way, Buena Park, Calif. 90620
Filed July 29, 1974, Ser. No. 492,414
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R

239,197
LAMP
James T. Poston, 8109 Clover Way, Buena Park, Calif. 90620
Filed July 29, 1974, Ser. No. 492,415
Term of patent 3½ years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R

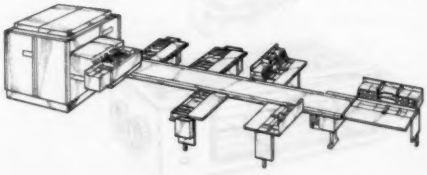


239,198
FLASHLIGHT
Gilbert Nau, Tour "Maine," Cite Sainte Catherine, 86100 Chatellerault, France
Filed May 13, 1974, Ser. No. 469,675
Claims priority, application France Apr. 25, 1974
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A

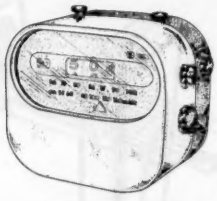
239,199
GASOLINE STATION FUEL DISPENSER
Charles Everett Cook, 2470 Kingscliff Drive NE., Atlanta, Ga. 30345
Filed May 28, 1974, Ser. No. 473,549
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D52—2 A



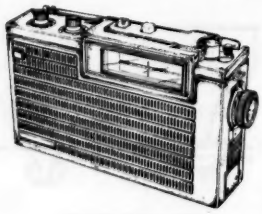
239,200
ENVELOPE OPENING MACHINE
Samuel S. Leotta, Jenkintown, Pa., assignor to Kenco Corporation, Cherry Hill, N.J.
Filed Sept. 15, 1972, Ser. No. 289,220
Term of patent 14 years
Int. Cl. D18—*04*
U.S. Cl. D55—1 R



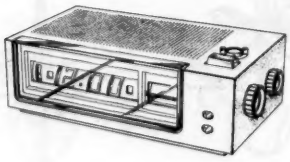
239,201
CLOCK RADIO
Kikuo Ohta, Katano, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed Oct. 16, 1973, Ser. No. 406,884
Claims priority, application Japan Apr. 19, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



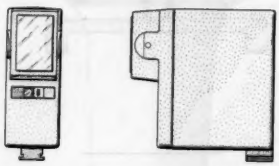
239,202
RADIO RECEIVER
Katsuhiko Makino, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed Feb. 13, 1974, Ser. No. 442,141
Claims priority, application Japan Aug. 14, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

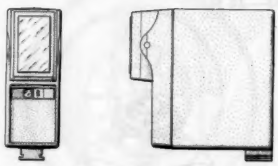


239,203
DIGITAL CLOCK RADIO
Masamichi Yamamura, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed Apr. 18, 1974, Ser. No. 462,062
Claims priority, application Japan Oct. 22, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

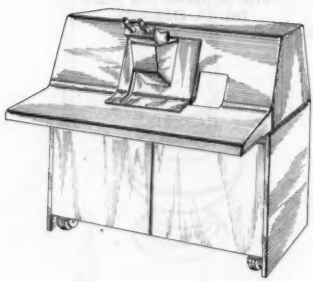


239,204
ELECTRONIC FLASH UNIT
Wilfried Holtje and Claus Prochnow, Braunschweig, Germany, assignors to Rollei-Werke Franke & Heidecke, Braunschweig, Germany
Filed Jan. 15, 1974, Ser. No. 433,532
Claims priority, application Germany Aug. 13, 1973; Aug. 20, 1973
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 F

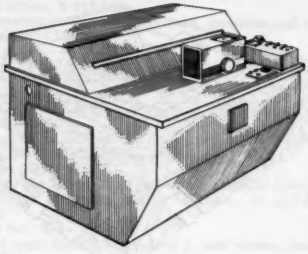




239,205
OPTICAL PROJECTION PRINTER
Ernest M. Bevilacqua, Wilton, and Alfred O. Scholze, New Canaan, Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.
Filed May 30, 1974, Ser. No. 474,868
Term of patent 7 years
Int. Cl. D18—*02*
U.S. Cl. D61—1 Q

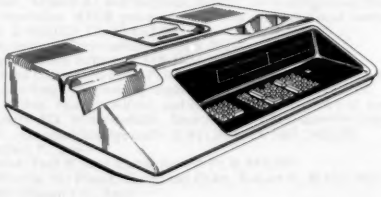


239,206
PHOTO ENLARGING APPARATUS
Carlos Cortez Valle, Las Vegas, Nev., assignor to Photo Button Industries, Inc., Las Vegas, Nev.
Filed Aug. 23, 1974, Ser. No. 500,160
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



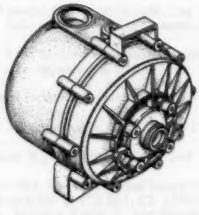
239,207
CONTROL HANDLE FOR AN OFFICE MACHINE
Charles M. Curley, Cortland, N.Y., assignor to SCM Corporation, New York, N.Y.
Filed Aug. 28, 1974, Ser. No. 501,120
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—11 B

239,208
CASE FOR A CHECK ENCODER
James W. Jacobson, St. Nom la Breteche, France, and Richard G. Clayton, Detroit, and Jerry J. Sims, Southfield, Mich., assignors to Burroughs Corporation, Detroit, Mich.
Continuation-in-part of design application Ser. No. 395,234, Sept. 7, 1973. This application Mar. 6, 1975, Ser. No. 555,955
Term of patent 14 years
The term of this patent subsequent to Feb. 3, 1990, has been disclaimed
Int. Cl. D14—*02*
U.S. Cl. D64—11 C

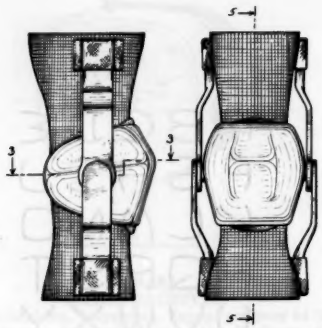


239,209
TYPE FONT
Carlton D. Blanchard, 580 Montauk Ave., New London, Conn. 06320
Continuation-in-part of abandoned design application Ser. No. 428,204, Dec. 26, 1973. This application June 23, 1975, Ser. No. 589,624
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D64—12 B

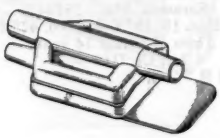
239,210
SELF-PRIMING CENTRIFUGAL PUMP
Alfred S. Marlow, 7472 Dickens Drive, Sarasota, Fla. 33581
Filed Dec. 18, 1973, Ser. No. 425,887
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D65—1 R



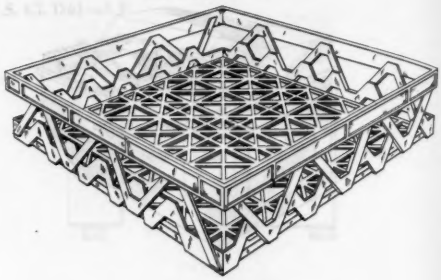
239,211
PIVOTAL BRACED PROTECTOR AND KNEE GUARD
Daniel Bednarczuk, 153–15 89th Ave., Jamaica, N.Y. 11432, and Arnold T. Milton, 7 Olmsted Road, Scarsdale, N.Y. 10583
Filed Oct. 11, 1974, Ser. No. 514,061
Term of patent 14 years
Int. Cl. D2—*02;* D24—*04*
U.S. Cl. D83—1 J



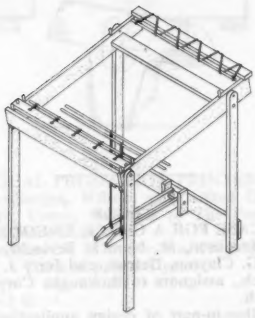
239,212
FILTER FOR PARENTERAL FLUIDS
Stephen H. O'Leary, San Diego, and Paul J. Melton, Carlsbad, Calif., assignors to IVAC Corporation, San Diego, Calif.
Filed May 13, 1974, Ser. No. 469,223
Term of patent 14 years
Int. Cl. D23—*99;* D24—*02*
U.S. Cl. D83—1 R



239,213
BAKERY TRAY OR THE LIKE
James C. Carroll, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed July 29, 1974, Ser. No. 492,832
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



239,214
TAPESTRY FLOOR LOOM
Jules Kliot, 2150 Stuart St., Berkeley, Calif. 94705
Filed June 11, 1973, Ser. No. 369,120
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D92—15



INDEX OF APPLICANTS AND ASSIGNEES

OF

PATENT APPLICATIONS PUBLISHED ON THE 16TH DAY OF MARCH, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abe, Fumiyuki; and Fukuda, Shigeo. Child restraining seat. B 520,341, Cl. 280-150.0AB.

Ablett, David Alan; and White, Robin Gordon, to Imperial Chemical Industries Limited. Spray device. B 491,776, Cl. 47-1.700.

Akai Electric Company, Limited: *See—*
Fukatsu, Shichiro, B 453,432.

Alevras, Constantino J. Vacuum haircutting apparatus and method. B 581,843, Cl. 30-133.000.

Allen, Donald J.: *See—*
Stenzel, Wallace I.; Krifrin, Frederick W.; and Allen, Donald J., B 593,781.

Allied Chemical Corporation: *See—*
Gordon, Joseph; and Sukornick, Bernard, B 111,130.

Altfelder, Reinhard: *See—*
Kruger, Karl-Heinz; and Altfelder, Reinhard, B 556,496.

American Home Products Corporation: *See—*
Mack, Frank J., B 562,601.

Anders, Larry E.; and Sutton, Joel F., to United States of America, Air Force. Bellcrank assembly, nozzle actuator. B 567,892, Cl. 239-265.390.

Applied Power Inc.: *See—*
Johnston, Eugene Dale; Roth, Sydney J.; and Marino, Joseph A., B 495,331.

Arlt, Dieter: *See—*
Lantzsch, Reinhard; and Arlt, Dieter, B 552,508.

Balaz, Alexander; Bone, David P.; and Shannon, Edward L., to Quaker Oats Company, The. Method of making a dry-type pet food. B 478,759, Cl. 426-656.000.

BASF Aktiengesellschaft: *See—*
Kempter, Firtz Erdmann; Sabelus, Gunther; and Spoor, Herbert, B 522,629.
Schaffner, Ernst; Eilingsfeld, Heinz; Schefczik, Ernst; and Patsch, Manfred, B 416,257.

Bass, Michael: *See—*
Milam, David; Bradbury, Rudolph A.; Picard, Richard H.; and Bass, Michael, B 530,569.

Baumann, Niklaus; and Schlunke, Hans-Peter, to Ciba-Geigy AG. Process for the photopolymerisation of ethylenically unsaturated compounds. B 420,176, Cl. 96-35.100.

Bayer Aktiengesellschaft: *See—*
Hofer, Wolfgang, B 455,486.
Lantzsch, Reinhard; and Arlt, Dieter, B 552,508.
Mayer, Karl Heinrich; Grewe, Ferdinand; and Frohberger, Paul-Ernst, B 407,014.

Beatrice Foods Co.: *See—*
Schwitters, Steve W., B 559,697.

Bell Telephone Laboratories, Incorporated: *See—*
Ngo, Peter Dinh-Tuan, B 520,613.

Beloit Corporation: *See—*
Sokolow, Nickolas N., B 397,674.

Berchtold, Jean, to Spin Physics, Inc. Material for magnetic transducer heads. B 059,512, Cl. 360-125.000.

Bielefeldt, Ernst-August, to Messerschmitt-Bolkow-Blohm GmbH - Division Hamburger Flugzeugbau. Centrifugal treatment of fluids. B 330,719, Cl. 210-512.00R.

Boisrayon, Gerald M.; Martin, Gilbert M.; and Mollard, Jean C., to Etat Francais represente par le Delegue ministeriel pour l'armement. Swivel air lock for airtight connection between submergibles. B 546,922, Cl. 114-16.600.

Bone, David P.: *See—*
Balaz, Alexander; Bone, David P.; and Shannon, Edward L., B 478,759.

Boosen, Karl-Josef: *See—*
Moulin, Francois; and Boosen, Karl-Josef, B 494,339.

Boutaine, Jean-Louis; Courtois, Guy; and Tanguy, Jean-Claude. Method for testing the adhesion between the rubber compound and the cord fabric of a pneumatic tyre. B 536,082, Cl. 250-303.000.

Bradbury, Rudolph A.: *See—*
Milam, David; Bradbury, Rudolph A.; Picard, Richard H.; and Bass, Michael, B 530,569.

Braytenbah, Andrew S.; and Jaegtnes, Karl O., to Westinghouse Electric Corporation. HTGR power plant turbine-generator load control system. B 464,027, Cl. 60-667.000.

British Hovercraft Corporation Limited: *See—*
Crago, William Arthur, B 489,550.

Bue, Richard C.; and Gorsuch, Phillip L., to Sico Incorporated. Counterbalance hinge for pivoting loads. B 594,871, Cl. 16-128.00R.

Buehler, Arthur; Fasciati, Alfred; and Hoelzie, Gerd, to Ciba Ltd. now Ciba-Geigy AG. Water-soluble, fiber-reactive phenylazodihydroxy, methyl, cyanopyridine dyestuffs. B 411,624, Cl. 260-156.000.

Cahn, Robert P.: *See—*
Geissler, Paul R.; and Cahn, Robert P., B 452,501.
Li, Norman N.; Hucal, Taras; and Cahn, Robert P., B 525,204.

Caterpillar Tractor Co.: *See—*
Nieman, John R., B 488,756.

Chambers, Joseph W.; and McTaggart, Lester E., to United States of America, Air Force. Ablative surface insulator. B 468,330, Cl. 428-175.000.

Chirino, Octavio I.; Hromek, Joseph; Joshi, Kailash C.; and Phillips, George C., Jr., to International Business Machines Corporation. Multilayer ceramic substrate structure. B 509,772, Cl. 174-68.500.

Ciba-Geigy AG: *See—*
Baumann, Niklaus; and Schlunke, Hans-Peter, B 420,176.
Kyburz, Rolf, B 333,247.

Ciba-Geigy Corporation: *See—*
Lohmann, Frank, B 528,297.
Merz, Jurg; and Schibler, Luzius, B 344,669.
Wick, Arnold, B 485,188.

Ciba Ltd. now Ciba-Geigy AG: *See—*
Buehler, Arthur; Fasciati, Alfred; and Hoelzie, Gerd, B 411,624.

Claasen, Theodoor Antonius Carel Maria; Mecklenbrauker, Wolfgang Friedrich Georg; and Peek, Johannes Bernhard Heinrich, to U.S. Philips Corporation. Recursive digital filter. B 484,121, Cl. 235-152.000.

Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Steroid total synthesis process utilizing a cyanoalkyl A-ring precursor. B 450,701, Cl. 260-345.900.

Cotrel, Claude; Jeanmart, Claude; and Messer, Mayer Naoum, to Rhone-Poulenc, S.A. 3-(Isopropyl amino alkoxy)-2-phenyl-isoindolin-1-ones. B 440,548, Cl. 260-325.0PH.

Courtois, Guy: *See—*
Boutaine, Jean-Louis; Courtois, Guy; and Tanguy, Jean-Claude, B 536,082.

Crago, William Arthur, to British Hovercraft Corporation Limited. Air cushion vehicles. B 489,550, Cl. 114-67.00A.

Crouch, Robert D.: *See—*
Stavropoulos, William S.; and Crouch, Robert D., B 452,879.

Dow Chemical Company, The: *See—*
Johnston, Howard, B 435,617.
Stavropoulos, William S.; and Crouch, Robert D., B 452,879.

Dunlop Limited: *See—*
Tippin, Arthur David, B 485,169.

Eilingsfeld, Heinz: *See—*
Schaffner, Ernst; Eilingsfeld, Heinz; Schefczik, Ernst; and Patsch, Manfred, B 416,257.

Elliott, Brian John, to International Business Machines Corporation. Precise coaxial attenuator for picosecond pulses. B 493,370, Cl. 333-81.00A.

Etat Francais represente par le Delegue ministeriel pour l'armement: *See—*
Boisrayon, Gerald M.; Martin, Gilbert M.; and Mollard, Jean C., B 546,922.

Fasciati, Alfred: *See—*
Buehler, Arthur; Fasciati, Alfred; and Hoelzie, Gerd, B 411,624.

Flory, John F. Articulated loading arm with end hoses for single point mooring. B 484,769, Cl. 114-230.000.

FMC Corporation: *See—*
Harnish, Wayne Nelson; and Ramsey, Arthur Albert, B 450,870.

Friedrich Uhde GmbH: *See—*
Kruger, Karl-Heinz; and Altfelder, Reinhard, B 556,496.

Frohberger, Paul-Ernst: *See—*
Mayer, Karl Heinrich; Grewe, Ferdinand; and Frohberger, Paul-Ernst, B 407,014.

Fujimoto, Akira: *See—*
Henderson, Edward E.; Fujimoto, Akira; and Gaw, Stanley E., B 503,780.

Fukase, Shigeo; and Kawabe, Ushio, to Hitachi, Ltd. Method of manufacturing thin-film field-emission electron source. B 453,031, Cl. 156-3.000.

Fukatsu, Shichiro, to Akai Electric Company, Limited. Automatic reverse type cassette tape recorder. B 453,432, Cl. 360-60.000.

Fukuda, Shigeo: *See—*
Abe, Fumiyuki; and Fukuda, Shigeo, B 520,341.

Garrett Corporation, The: *See—*
Sullivan, Richard N.; and Vance, John E., B 522,080.

Gaw, Stanley E.: *See—*
Henderson, Edward E.; Fujimoto, Akira; and Gaw, Stanley E., B 503,780.

Geissler, Paul R.; and Cahn, Robert P. Dual temperature gradient elution liquid chromatography. B 452,501, Cl. 210-24.000.

Gencarelli, Richard A.; Hughes, Keith A.; and Sierakowski, John F., to Uniroyal, Inc. Extreme pressure additive for lubricants. B 441,723, Cl. 252-33.600.

General Electric Co.: *See—*
Stefani, Joseph P., B 531,566.

Gertsch AG: *See—*
Weigl, Erwin, B 435,570.

Giken Kogyo Kabushiki Kaisha: *See—*
Kurose, Masayuki, B 504,439.

Giulie, Joe D., to Minnesota Mining & Manufacturing Company. Binder unit for stapled booklets. B 491,618, Cl. 281-25.00R.

Gold, Donald B. Method for making a furniture construction. B 504,061, Cl. 29-415.000.

Gordon, Joseph; and Sukornick, Bernard, to Allied Chemical Corporation. Manufacture of nitrogen trifluoride. B 111,130, Cl. 423-406.000.

Gorsuch, Phillip L.: *See—*
Bue, Richard C.; and Gorsuch, Phillip L., B 594,871.

Grewe, Ferdinand: *See—*
Mayer, Karl Heinrich; Grewe, Ferdinand; and Frohberger, Paul-Ernst, B 407,014.

Hagino, Hiroyasu: *See—*
Kajiwara, Yasuya; Nagai, Seiichi; and Hagino, Hiroyasu, B 535,209.

Harnish, Wayne Nelson; and Ramsey, Arthur Albert, to FMC Corporation. Substituted 2-arylquinazolines as fungicides. B 450,870, Cl. 424-251.000.

Henderson, Edward E.; Fujimoto, Akira; and Gaw, Stanley E., to Sperry Rand Corporation. Control system for magnetic disc storage device. B 503,780, Cl. 340-172.500.

Henman, Terence John; and Williams, Graham, to Imperial Chemical Industries Limited. Polymer composition. B 257,143, Cl. 260-42.150.

Hester, Jackson B., Jr., to Upjohn Company, The. 2-[(3-Phthalimidomethyl)-5-methyl-4H-1,2,4-triazol-4-yl]benzophenones. B 471,494, Cl. 260-308.00R.

Hiruma, Mituo. Vehicle hydropneumatic suspension system with vehicle body height control means. B 471,706, Cl. 280-124.00F.

Hitachi Chemical Co., Ltd.: *See—*
Shoji, Fusaji; Kohgame, Hisashi; and Muroi, Tadashi, B 469,468.

Hitachi, Ltd.: *See—*
Fukase, Shigeo; and Kawabe, Ushio, B 453,031.
Iyama, Akiyoshi; Ito, Toshi; Tajima, Katsutoshi; and Ishibashi, Hiroshi, B 347,661.
Kihara, Toshimasa, B 560,488.
Kita, Yuzo; and Watanabe, Kazuo, B 391,844.
Misawa, Yutaka; Kamei, Tatsuya; and Nagano, Takahiro, B 480,292.
Nakazaki, Takamitsu; Kita, Hisanao; Yonezawa, Tatsuo; and Okamura, Hisanori, B 479,502.
Otomo, Yoshiro, B 384,225.
Shoji, Fusaji; Kohgame, Hisashi; and Muroi, Tadashi, B 469,468.

Hoechst Aktiengesellschaft: *See—*
Meininger, Fritz; Schlafer, Ludwig; and Kallay, Maria, B 407,205.

Hoelzie, Gerd: *See—*
Buehler, Arthur; Fasciati, Alfred; and Hoelzie, Gerd, B 411,624.

Hofer, Wolfgang, to Bayer Aktiengesellschaft. Preparation of O,S-dimethyl-thiol-phosphoric acid diester-amide. B 455,486, Cl. 260-984.000.

Hoffmann-La Roche Inc.: *See—*
Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, B 450,701.

Hromek, Joseph: *See—*
Chirino, Octavio I.; Hromek, Joseph; Joshi, Kailash C.; and Phillips, George C., Jr., B 509,772.

Hucal, Taras: *See—*
Li, Norman N.; Hucal, Taras; and Cahn, Robert P., B 525,204.

Huff, Terrence: *See—*
Johnson, Burnett H.; and Huff, Terrence, B 372,232.

Hughes, Keith A.: *See—*
Gencarelli, Richard A.; Hughes, Keith A.; and Sierakowski, John F., B 441,723.

Iizuka, Haruhiko: *See—*
Takeuchi, Yasuhisa; and Iizuka, Haruhiko, B 575,583.

Ilford Limited: *See—*
Neale, Denis Manktelow; and Throssell, Michael Gordon, B 469,036.

Imperial Chemical Industries Limited: *See—*
Ablett, David Alan; and White, Robin Gordon, B 491,776.
Henman, Terence John; and Williams, Graham, B 257,143.
Wyatt, Ronald John, B 271,743.

International Business Machines Corporation: *See—*
Chirino, Octavio I.; Hromek, Joseph; Joshi, Kailash C.; and Phillips, George C., Jr., B 509,772.
Elliott, Brian John, B 493,370.
Lankford, Larry Gene; and Whittle, William Robert, B 540,767.

Intertechnique, S.A.: *See—*
Rapkin, Edward, B 071,613.

Ishibashi, Hiroshi: *See—*
Iyama, Akiyoshi; Ito, Toshi; Tajima, Katsutoshi; and Ishibashi, Hiroshi, B 347,661.

Ito, Toshi: *See—*
Iyama, Akiyoshi; Ito, Toshi; Tajima, Katsutoshi; and Ishibashi, Hiroshi, B 347,661.

Iyama, Akiyoshi; Ito, Toshi; Tajima, Katsutoshi; and Ishibashi, Hiroshi, to Hitachi, Ltd. Video signal recording and reproducing apparatus for stop motion picture. B 347,661, Cl. 360-35.000.

Jaegtnes, Karl O.: *See—*
Braytenbah, Andrew S.; and Jaegtnes, Karl O., B 464,027.

Jeanmart, Claude: *See—*
Cotrel, Claude; Jeanmart, Claude; and Messer, Mayer Naoum, B 440,548.

Johnson, Burnett H.; and Huff, Terrence. Wettable non-woven structures and components thereof. B 372,232, Cl. 8-115.500.

Johnson, Curtis R.; and Paschkis, Albert E., to Leeds & Northrup Company. Stylus for recording on heat sensitive material. B 560,261, Cl. 346-139.00C.

Johnson, Wayne F. Photomultiplier tube gain regulating system. B 566,572, Cl. 250-564.000.

Johnston, Eugene Dale; Roth, Sydney J.; and Marino, Joseph A., to Applied Power Inc. Engine diagnostic apparatus. B 495,331, Cl. 324-15.000.

Johnston, Howard, to Dow Chemical Company, The. Substituted pyrimidinyloxy(thio)phenyl ureas and derivatives thereof. B 435,617, Cl. 260-256.40C.

Joshi, Kailash C.: *See—*
Chirino, Octavio I.; Hromek, Joseph; Joshi, Kailash C.; and Phillips, George C., Jr., B 509,772.

Kajiwara, Yasuya; Nagai, Seiichi; and Hagino, Hiroyasu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device. B 535,209, Cl. 357-59.000.

Kallay, Maria: *See—*
Meininger, Fritz; Schlafer, Ludwig; and Kallay, Maria, B 407,205.

Kamei, Tatsuya: *See—*
Misawa, Yutaka; Kamei, Tatsuya; and Nagano, Takahiro, B 480,292.

Kawabe, Ushio: *See—*
Fukase, Shigeo; and Kawabe, Ushio, B 453,031.

Kawamoto, Kinji: *See—*
Tsunoo, Masahiko; and Kawamoto, Kinji, B 476,568.

Kempter, Firtz Erdmann; Sabelus, Gunther; and Spoor, Herbert, to BASF Aktiengesellschaft. Paint binders of mannich bases and epoxy resins. B 522,629, Cl. 260-29.2EP.

Kihara, Toshimasa, to Hitachi, Ltd. Binary incrementer circuit. B 560,488, Cl. 235-175.000.

Kimura, Susumu: *See—*
Nakagawa, Yasuhiko; Terasaka, Katsunori; Kimura, Susumu; and Yoshioka, Masanobu, B 467,486.

Kimura, Toshimitsu: *See—*
Usui, Hideyuki; and Kimura, Toshimitsu, B 520,952.

King Instrument Corporation: *See—*
King, James L., B 535,448.

King, James L., to King Instrument Corporation. Automatic cassette loading machine. B 535,448, Cl. 242-56.00R.

Kita, Hisanao: *See—*
Nakazaki, Takamitsu; Kita, Hisanao; Yonezawa, Tatsuo; and Okamura, Hisanori, B 479,502.

Kita, Yuzo; and Watanabe, Kazuo, to Hitachi, Ltd. Interrupt information interface system. B 391,844, Cl. 340-172.500.

Kohgame, Hisashi: *See—*
Shoji, Fusaji; Kohgame, Hisashi; and Muroi, Tadashi, B 469,468.

Koppern & Co. KG.: *See—*
Mersch, Peter; Siepermann, Walter; and Zech, Kurt, B 431,334.

Kreighbaum, William E., to Mead Johnson & Company. Alkanesulfonamido triphenylethylenes. B 457,931, Cl. 260-247.10R.

Krifrin, Frederick W.: *See—*
Stenzel, Wallace I.; Krifrin, Frederick W.; and Allen, Donald J., B 593,781.

Kruger, Karl-Heinz; and Altfelder, Reinhard, to Friedrich Uhde GmbH. Control system for steam flowrate and steam pressure. B 556,496, Cl. 60-660.000.

Kurose, Masayuki, to Giken Kogyo Kabushiki Kaisha. Retaining walls. B 504,439, Cl. 61-49.000.

Kyburz, Rolf, to Ciba-Geigy AG. Process for crosslinking hydrophilic colloids using vinyl substituted, SO_2 containing, amine salt. B 333,247, Cl. 260-117.000.

Lankford, Larry Gene; and Whittle, William Robert, to International Business Machines Corporation. Automatic tool deflection calibration system. B 540,767, Cl. 235-151.110.

Lantzsch, Reinhard; and Arit, Dieter, to Bayer Aktiengesellschaft. Process for preparing 4-amino-2,2,6,6-tetramethyl piperidine. B 552,508, Cl. 260-293.520.

Leeds & Northrup Company: *See—*
Johnson, Curtis R.; and Paschkis, Albert E., B 560,261.

Levine, Seymour, to United States of America, Air Force. Mechanical retention system for use with caseless ammunition. B 279,415, Cl. 102-38.000.

Li, Norman N.; Hucal, Taras; and Cahn, Robert P. Demulsification process. B 525,204, Cl. 210-22.00R.

Lohmann, Frank, to Ciba-Geigy Corporation. Stable solutions of fluorescent brighteners. B 528,297, Cl. 252-301.20W.

Longo, John M. Process for the desulfurization of flue gas. B 499,324, Cl. 423-244.000.

Lonza, Ltd.: *See—*
Moulin, Francois; and Boosen, Karl-Josef, B 494,339.

Mack, Frank J., to American Home Products Corporation. Dispenser combined with hanging clip for inverted support. B 562,601, Cl. 222-181.000.

Marino, Joseph A.: *See—*
Johnston, Eugene Dale; Roth, Sydney J.; and Marino, Joseph A., B 495,331.

Martin, Gilbert M.: *See—*
Boisrayon, Gerald M.; Martin, Gilbert M.; and Mollard, Jean C., B 546,922.

Marubeni Corporation: *See—*
Yoshida, Yoshimasa, B 503,521.

Matsushita Electric Industrial Co.: *See—*
Tsunoo, Masahiko; and Kawamoto, Kinji, B 476,568.

Mayer, Karl Heinrich; Grewe, Ferdinand; and Frohberger, Paul-Ernst, to Bayer Aktiengesellschaft. 1-Alkoxycarbonyl-2-(bis-(alkoxycarbonyl)-amino)-benzimidazoles. B 407,014, Cl. 260-309.200.

McTaggart, Lester E.: *See—*
Chambers, Joseph W.; and McTaggart, Lester E., B 468,330.

Mead Johnson & Company: *See*—
Kreighbaum, William E., B 457,931.
Mecklenbrauker, Wolfgang Friedrich Georg: *See*—
Claasen, Theodoor Antonius Carel Maria; Mecklenbrauker, Wolfgang Friedrich Georg; and Peek, Johannes Bernhard Heinrich, B 484,121.
Meininger, Fritz; Schlafer, Ludwig; and Kallay, Maria, to Hoechst Aktiengesellschaft. Dyeing cellulose with aminonaphthyl azobenzene vinyl type reactive dyes. B 407,205, Cl. 8-1.00E.
Merlin Gerin SA: *See*—
Poncet, Alain; and Roccaz, Serge, B 562,413.
Mersch, Peter; Siepermann, Walter; and Zech, Kurt, to Koppern & Co. KG. Roll briquetting press. B 43i,334, Cl. 425-237.000.
Merz, Jurg; and Schibler, Luzius, to Ciba-Geigy Corporation. Production of alkoxylated N-methylol compounds. B 344,669, Cl. 260-249.600.
Messer, Mayer Naoum: *See*—
Cotrel, Claude; Jeanmart, Claude; and Messer, Mayer Naoum, B 440,548.
Messerschmitt-Bolkow-Blohm GmbH - Division Hamburger Flugzeugbau: *See*—
Bielefeldt, Ernst-August, B 330,719.
Milam, David; Bradbury, Rudolph A.; Picard, Richard H.; and Bass, Michael, to United States of America, Air Force. Method and apparatus for determining the mechanism responsible for laser-induced damage. B 530,569, Cl. 356-239.000.
Minnesota Mining & Manufacturing Company: *See*—
Giulie, Joe D., B 491,618.
Misawa, Yutaka; Kamei, Tatsuya; and Nagano, Takahiro, to Hitachi, Ltd. High withstand voltage-semiconductor device with shallow grooves between semiconductor region and field limiting rings. B 480,292, Cl. 357-55.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Kajiwara, Yasuya; Nagai, Seiichi; and Hagino, Hiroyasu, B 535,209.
Mollard, Jean C.: *See*—
Boisrayon, Gerald M.; Martin, Gilbert M.; and Mollard, Jean C., B 546,922.
Moore, David W., to TRW Inc. Variable property wire mesh antenna structure. B 494,691, Cl. 343-840.000.
Moulin, Francois; and Boosen, Karl-Josef, to Lonza, Ltd. Process for the production of cyanopyridines. B 494,339, Cl. 260-294.900.
Mukai, Kosaburo; Shinzawa, Motohiro; and Yasuhara, Seishi. Spark ignition engine having combustion chamber provided with vent valve. B 466,906, Cl. 123-191.00S.
Muroi, Tadashi: *See*—
Shoji, Fusaji; Kohgame, Hisashi; and Muroi, Tadashi, B 469,468.
Nagai, Seiichi: *See*—
Kajiwara, Yasuya; Nagai, Seiichi; and Hagino, Hiroyasu, B 535,209.
Nagano, Takahiro: *See*—
Misawa, Yutaka; Kamei, Tatsuya; and Nagano, Takahiro, B 480,292.
Nakagawa, Yasuhiko; Terasaka, Katsunori; Kimura, Susumu; and Yoshioka, Masanobu. Internal combustion engine having auxiliary combustion chambers. B 467,486, Cl. 123-32.0SP.
Nakazaki, Takamitsu; Kita, Hisanao; Yonezawa, Tatsuo; and Okamura, Hisanori, to Hitachi, Ltd. Welding method for dissimilar metals. B 479,502, Cl. 219-121.0EM.
Neale, Denis Manktelow; and Throssell, Michael Gordon, to Ilford Limited. Scanning device. B 469,036, Cl. 350-7.000.
Ngo, Peter Dinh-Tuan, to Bell Telephone Laboratories, Incorporated. Plasma discharge shift registers. B 520,613, Cl. 315-169.0TV.
Nieman, John R., to Caterpillar Tractor Co. Method and apparatus for introducing additives into a casting mold. B 488,756, Cl. 164-57.000.
Nissan Motor Company, Limited: *See*—
Usui, Hideyuki; and Kimura, Toshimitsu, B 520,952.
Notari, Bruno; and Rivola, Luigi, to Snam Progetti, S.p.A. Process for the production of aluminum chlorohydroxides having a controlled chlorine content. B 336,754, Cl. 423-462.000.
Okamura, Hisanori: *See*—
Nakazaki, Takamitsu; Kita, Hisanao; Yonezawa, Tatsuo; and Okamura, Hisanori, B 479,502.
Osgerby, Ian T., to United States of America, Air Force. Recirculation or stirred reactor flow laser. B 442,295, Cl. 331-94.50G.
Otomo, Yoshiro, to Hitachi, Ltd. Electro-optic ceramic material. B 384,225, Cl. 350-150.000.
Pankove, Jacques Isaac, to RCA Corporation. Insulating nitride compounds as electron emitters. B 517,762, Cl. 313-94.000.
Paschkis, Albert E.: *See*—
Johnson, Curtis R.; and Paschkis, Albert E., B 560,261.
Patsch, Manfred: *See*—
Schaffner, Ernst; Eilingsfeld, Heinz; Schefczik, Ernst; and Patsch, Manfred, B 416,257.
Peek, Johannes Bernhard Heinrich: *See*—
Claasen, Theodoor Antonius Carel Maria; Mecklenbrauker, Wolfgang Friedrich Georg; and Peek, Johannes Bernhard Heinrich, B 484,121.
Pennings, William E.: *See*—
Toto, John A.; and Pennings, William E., B 481,048.
Phillips, George C., Jr.: *See*—
Chirino, Octavio I.; Hromek, Joseph; Joshi, Kailash C.; and Phillips, George C., Jr., B 509,772.
Picard, Richard H.: *See*—
Milam, David; Bradbury, Rudolph A.; Picard, Richard H.; and Bass, Michael, B 530,569.
Pitney-Bowes, Inc.: *See*—
Toto, John A.; and Pennings, William E., B 481,048.
Poncet, Alain; and Roccaz, Serge, to Merlin Gerin SA. Gastight liquid-type dynamic seal for control shafts of pressurized circuit interrupters. B 562,413, Cl. 308-36.300.
Procter & Gamble Company, The: *See*—
Sisson, James Bryant, B 333,110.
Quaker Oats Company, The: *See*—
Balaz, Alexander; Bone, David P.; and Shannon, Edward L., B 478,759.
Ramsey, Arthur Albert: *See*—
Harnish, Wayne Nelson; and Ramsey, Arthur Albert, B 450,870.
Rapkin, Edward, to Intertechnique, S.A. System and method of liquid scintillation counting. B 071,613, Cl. 250-328.000.
RCA Corporation: *See*—
Pankove, Jacques Isaac, B 517,762.
Rhone-Poulenc, S.A.: *See*—
Cotrel, Claude; Jeanmart, Claude; and Messer, Mayer Naoum, B 440,548.
Rivola, Luigi: *See*—
Notari, Bruno; and Rivola, Luigi, B 336,754.
Robertshaw Controls Company: *See*—
Tyler, Hugh J., B 499,786.
Roccaz, Serge: *See*—
Poncet, Alain; and Roccaz, Serge, B 562,413.
Rohmfeld, Josef, to Siemens Aktiengesellschaft. X-ray tube for microstructure analysis. B 520,884, Cl. 313-330.000.
Rosenberger, Michael: *See*—
Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, B 450,701.
Roth, Sydney J.: *See*—
Johnston, Eugene Dale; Roth, Sydney J.; and Marino, Joseph A., B 495,331.
Sabelus, Gunther: *See*—
Kempter, Firtz Erdmann; Sabelus, Gunther; and Spoor, Herbert, B 522,629.
Saucy, Gabriel: *See*—
Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, B 450,701.
Schaffner, Ernst; Eilingsfeld, Heinz; Schefczik, Ernst; and Patsch, Manfred, to BASF Aktiengesellschaft. Production of 3-monochloro-2,4,5-trialkylbenzophenones and 3,6-dichloro-2,4,5-trialkylbenzophenones. B 416,257, Cl. 260-591.000.
Schefczik, Ernst: *See*—
Schaffner, Ernst; Eilingsfeld, Heinz; Schefczik, Ernst; and Patsch, Manfred, B 416,257.
Schibler, Luzius: *See*—
Merz, Jurg; and Schibler, Luzius, B 344,669.
Schlafer, Ludwig: *See*—
Meininger, Fritz; Schlafer, Ludwig; and Kallay, Maria, B 407,205.
Schlunke, Hans-Peter: *See*—
Baumann, Niklaus; and Schlunke, Hans-Peter, B 420,176.
Schwitters, Steve W., to Beatrice Foods Co. Apparatus for dispensing beverages. B 559,697, Cl. 222-56.000.
Sem-Sandberg, Sverre George. Method and apparatus for measuring relative phase shift between two pulse trains. B 458,010, Cl. 324-83.00D.
Shannon, Edward L.: *See*—
Balaz, Alexander; Bone, David P.; and Shannon, Edward L., B 478,759.
Shinzawa, Motohiro: *See*—
Mukai, Kosaburo; Shinzawa, Motohiro; and Yasuhara, Seishi, B 466,906.
Shoji, Fusaji; Kohgame, Hisashi; and Muroi, Tadashi, to Hitachi, Ltd.; and Hitachi Chemical Co., Ltd. Method for producing thermoplastic resin. B 469,468, Cl. 260-878.00R.
Sico Incorporated: *See*—
Bue, Richard C.; and Gorsuch, Phillip L., B 594,871.
Siegel, Karl-Heinz. Handle package. B 461,250, Cl. 150-3.000.
Siemens Aktiengesellschaft: *See*—
Rohmfeld, Josef, B 520,884.
Siepermann, Walter: *See*—
Mersch, Peter; Siepermann, Walter; and Zech, Kurt, B 431,334.
Sierakowski, John F.: *See*—
Gencarelli, Richard A.; Hughes, Keith A.; and Sierakowski, John F., B 441,723.
Sirrine, Edwin B., to United States of America, Air Force. Adaptive gray scale control circuit for television video signals. B 561,770, Cl. 178-7.3DC.
Sisson, James Bryant, to Procter & Gamble Company, The. Absorptive devices having porous backsheet. B 333,110, Cl. 428-132.000.
Snam Progetti, S.p.A.: *See*—
Notari, Bruno; and Rivola, Luigi, B 336,754.
Sokolow, Nickolas N., to Beloit Corporation. Extruder plasticizing and mixing screw. B 397,674, Cl. 259-191.000.
Sperry Rand Corporation: *See*—
Henderson, Edward E.; Fujimoto, Akira; and Gaw, Stanley E., B 503,780.
Spin Physics, Inc.: *See*—
Berchtold, Jean, B 059,512.
Spoor, Herbert: *See*—
Kempter, Firtz Erdmann; Sabelus, Gunther; and Spoor, Herbert, B 522,629.

Stavropoulos, William S.; and Crouch, Robert D., to Dow Chemical Company, The. Method for determination of triglycerides and glycerol. B 452,879, Cl. 195-103.50R.
Stefani, Joseph P., to General Electric Co. Angled assembly of PCB dimmer. B 531,566, Cl. 317-120.000.
Stenzel, Wallace I.; Krifrin, Frederick W.; and Allen, Donald J., to Waukee Engineering Co. Firecheck. B 593,781, Cl. 48-192.000.
Sukornick, Bernard: *See—*
Gordon, Joseph; and Sukornick, Bernard, B 111,130.
Sullivan, Richard N.; and Vance, John E., to Garrett Corporation, The. Gearbox decoupler. B 522,080, Cl. 192-46.000.
Sutton, Joel F.: *See—*
Anders, Larry E.; and Sutton, Joel F., B 567,892.
Sykes Datatronics Inc.: *See—*
Sykes, John R., B 516,069.
Sykes, John R., to Sykes Datatronics Inc. Data recording with high speed search capability. B 516,069, Cl. 360-49.000.
Tajima, Katsutoshi: *See—*
Iyama, Akiyoshi; Ito, Toshi; Tajima, Katsutoshi; and Ishibashi, Hiroshi, B 347,661.
Takeuchi, Yasuhisa; and Iizuka, Haruhiko. Vehicle skid control system including vehicle speed sensor. B 575,583, Cl. 303-21.0BE.
Tanguy, Jean-Claude: *See—*
Boutaine, Jean-Louis; Courtois, Guy; and Tanguy, Jean-Claude, B 536,082.
Terasaka, Katsunori: *See—*
Nakagawa, Yasuhiko; Terasaka, Katsunori; Kimura, Susumu; and Yoshioka, Masanobu, B 467,486.
Throssell, Michael Gordon: *See—*
Neale, Denis Manktelow; and Throssell, Michael Gordon, B 469,036.
Tippin, Arthur David, to Dunlop Limited. Method and apparatus for moulding tires employing pivoting tread forming segments. B 485,169, Cl. 264-315.000.
Toto, John A.; and Pennings, William E., to Pitney-Bowes, Inc. Photoconductor storing apparatus for an electrostatic copier. B 481,048, Cl. 355-16.000.
TRW Inc.: *See—*
Moore, David W., B 494,691.
Tsunoo, Masahiko; and Kawamoto, Kinji, to Matsushita Electric Industrial Co. Voice keying system for a voice controlled musical instrument. B 476,568, Cl. 84-1.010.
Tyler, Hugh J., to Robertshaw Controls Company. Damper actuator. B 499,786, Cl. 74-424.8VA.
Uniroyal, Inc.: *See—*
Gencarelli, Richard A.; Hughes, Keith A.; and Sierakowski, John F., B 441,723.
United States of America
Air Force: *See—*
Anders, Larry E.; and Sutton, Joel F., B 567,892.
Chambers, Joseph W.; and McTaggart, Lester E., B 468,330.
Levine, Seymour, B 279,415.
Milam, David; Bradbury, Rudolph A.; Picard, Richard H.; and Bass, Michael, B 530,569.
Osgerby, Ian T., B 442,295.
Sirrine, Edwin B., B 561,770.
U.S. Philips Corporation: *See—*
Claasen, Theodoor Antonius Carel Maria; Mecklenbrauker, Wolfgang Friedrich Georg; and Peek, Johannes Bernhard Heinrich, B 484,121.
Upjohn Company, The: *See—*
Hester, Jackson B., Jr., B 471,494.
Usui, Hideyuki; and Kimura, Toshimitsu, to Nissan Motor Company, Limited. One-way support for steering column. B 520,952, Cl. 248-205.00R.
Vance, John E.: *See—*
Sullivan, Richard N.; and Vance, John E., B 522,080.
Watanabe, Kazuo: *See—*
Kita, Yuzo; and Watanabe, Kazuo, B 391,844.
Waukee Engineering Co.: *See—*
Stenzel, Wallace I.; Krifrin, Frederick W.; and Allen, Donald J., B 593,781.
Weigl, Erwin, to Gertsch AG. Ski binding component. B 435,570, Cl. 280-11.35R.
Westinghouse Electric Corporation: *See—*
Braytenbah, Andrew S.; and Jaegtnes, Karl O., B 464,027.
White, Robin Gordon: *See—*
Ablett, David Alan; and White, Robin Gordon, B 491,776.
Whittle, William Robert: *See—*
Lankford, Larry Gene; and Whittle, William Robert, B 540,767.
Wick, Arnold, to Ciba-Geigy Corporation. Process for bulk dyeing high molecular organic compounds. B 485,188, Cl. 260-40.00P.
Williams, Graham: *See—*
Henman, Terence John; and Williams, Graham, B 257,143.
Wyatt, Ronald John, to Imperial Chemical Industries Limited. Copolymerisation of olefins. B 271,743, Cl. 260-80.780.
Yasuhara, Seishi: *See—*
Mukai, Kosaburo; Shinzawa, Motohiro; and Yasuhara, Seishi, B 466,906.
Yonezawa, Tatsuo: *See—*
Nakazaki, Takamitsu; Kita, Hisanao; Yonezawa, Tatsuo; and Okamura, Hisanori, B 479,502.
Yoshida, Yoshimasa, to Yoshida, Yoshimasa; and Marubeni Corporation. Cylindrical belt conveyor system. B 503,521, Cl. 198-129.000.
Yoshioka, Masanobu: *See—*
Nakagawa, Yasuhiko; Terasaka, Katsunori; Kimura, Susumu; and Yoshioka, Masanobu, B 467,486.
Zech, Kurt: *See—*
Mersch, Peter; Siepermann, Walter; and Zech, Kurt, B 431,334.

CLASSIFICATION OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM

DATE PUBLISHED MARCH 16, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
Class 8			
1E	B 407,205	C	Mar. 16, 1976
10.2	B 430,334	C	Jan. 27, 1976
14	B 460,388	C	Jan. 27, 1976
	B 497,473	C	Feb. 3, 1976
17	B 458,060	C	Jan. 13, 1976
62	B 507,476	C	Feb. 10, 1976
74	B 354,959	C	Feb. 17, 1976
84	B 495,903	C	Feb. 17, 1976
115.5	B 372,232	C	Mar. 16, 1976
115.7	B 389,304	C	Jan. 27, 1976
142	B 423,867	C	Feb. 3, 1976
161	B 461,352	C	Jan. 13, 1976
174	B 344,967	C	Feb. 3, 1976
Class 15			
147A	B 502,667	M	Feb. 24, 1976
229A	B 523,885	M	Feb. 17, 1976
256.53	B 579,116	M	Feb. 3, 1976
302	B 553,629	M	Feb. 24, 1976
Class 16			
128R	B 594,871	M	Mar. 16, 1976
Class 17			
23	B 519,599	M	Feb. 17, 1976
2502	B 541,496	E	Jan. 27, 1976
Class 19			
155	B 569,501	M	Mar. 9, 1976
Class 21			
2.7R	B 527,999	C	Feb. 3, 1976
Class 23			
230B	B 554,039	C	Feb. 24, 1976
273SP	B 431,785	C	Feb. 24, 1976
273V	B 563,165	C	Mar. 9, 1976
285F	B 565,180	C	Jan. 27, 1976
Class 24			
75	B 532,476	M	Feb. 3, 1976
Class 28			
1.6	B 497,292	M	Feb. 3, 1976
Class 29			
96	B 546,911	M	Jan. 13, 1976
127	B 510,855	M	Jan. 27, 1976
180SS	B 421,975	C	Mar. 2, 1976
237	B 503,436	M	Feb. 24, 1976
415	B 504,061	M	Mar. 16, 1976
428	B 520,928	M	Jan. 13, 1976
578	B 561,732	M	Feb. 3, 1976
580	B 492,301	M	Jan. 13, 1976
Class 30			
133	B 581,843	M	Mar. 16, 1976
Class 32			
10A	B 491,501	M	Jan. 13, 1976
Class 33			
174S	B 498,820	M	Mar. 9, 1976
Class 35			
36	B 511,454	M	Feb. 24, 1976
Class 37			
8	B 558,819	M	Feb. 3, 1976
57	B 531,753	M	Mar. 2, 1976
142A	B 511,099	M	Feb. 3, 1976
Class 40			
28C	B 493,981	M	Mar. 9, 1976
159	B 456,153	M	Mar. 9, 1976
Class 43			
129	B 442,866	M	Feb. 24, 1976

		CAT.	PUB. DATE
Class 44			
2	B 496,792	C	Feb. 17, 1976
Class 47			
1.7	B 491,776	M	Mar. 16, 1976
57.6	B 548,028	M	Feb. 3, 1976
Class 48			
73	B 541,376	C	Feb. 17, 1976
192	B 593,781	C	Mar. 16, 1976
358	B 576,859	M	Feb. 24, 1976
Class 51			
358	B 576,859	M	Feb. 24, 1976
Class 52			
207	B 459,597	M	Feb. 17, 1976
484	B 522,354	M	Jan. 20, 1976
Class 53			
77	B 508,878	M	Feb. 3, 1976
Class 55			
105	B 490,806	C	Feb. 3, 1976
352	B 543,941	C	Jan. 13, 1976
Class 56			
14.5	B 549,244	M	Jan. 27, 1976
15.9	B 558,973	M	Feb. 10, 1976
Class 57			
140BY	B 495,124	M	Mar. 9, 1976
Class 58			
21.13	B 516,825	M	Feb. 3, 1976
Class 60			
226A	B 445,459	M	Feb. 3, 1976
299	B 551,133	M	Mar. 2, 1976
304	B 502,540	M	Jan. 13, 1976
349	B 541,464	M	Feb. 17, 1976
422	B 526,445	M	Jan. 20, 1976
424	B 584,520	M	Jan. 27, 1976
425	B 535,386	M	Jan. 13, 1976
431	B 551,809	M	Feb. 24, 1976
445	B 400,871	M	Feb. 17, 1976
592	B 465,145	M	Jan. 27, 1976
645	B 538,472	M	Feb. 3, 1976
660	B 556,496	M	Mar. 16, 1976
667	B 464,027	M	Mar. 16, 1976
690	B 505,689	M	Mar. 2, 1976
706	B 509,238	M	Feb. 24, 1976
Class 61			
.5	B 554,283	M	Jan. 27, 1976
49	B 504,439	M	Mar. 16, 1976
Class 62			
306	B 522,009	M	Feb. 17, 1976
353	B 564,314	M	Jan. 20, 1976
Class 64			
27L	B 509,043	M	Feb. 24, 1976
Class 65			
3A	B 532,969	C	Jan. 13, 1976
49	B 517,858	C	Feb. 17, 1976
239	B 545,777	C	Jan. 27, 1976
Class 66			
116	B 438,882	M	Feb. 24, 1976
Class 71			
113	B 535,076	C	Jan. 20, 1976
Class 72			
43	B 546,631	M	Feb. 3, 1976
56	B 489,290	M	Feb. 17, 1976
88	B 575,757	M	Jan. 27, 1976
391	B 516,537	M	Feb. 17, 1976

CLASSIFICATION OF PUBLISHED PATENT APPLICATIONS

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
Class 73			
24	B 506,744	M	Jan. 13, 1976
29	B 557,153	M	Feb. 3, 1976
37.7	B 532,319	M	Feb. 3, 1976
61.1R	B 511,909	M	Feb. 17, 1976
67.5H	B 522,309	M	Feb. 3, 1976
116	B 569,859	M	Mar. 9, 1976
147	B 521,620	M	Jan. 27, 1976
190R	B 480,350	M	Feb. 10, 1976
302	B 464,290	M	Feb. 3, 1976
422GC	B 490,547	M	Feb. 24, 1976
432R	B 415,021	M	Mar. 2, 1976
437	B 528,401	M	Feb. 3, 1976
557	B 523,080	M	Feb. 17, 1976
Class 74			
18.2	B 501,975	M	Mar. 2, 1976
242.1A	B 567,854	M	Feb. 3, 1976
243C	B 558,818	M	Jan. 13, 1976
424.8VA	B 499,786	M	Mar. 16, 1976
479	B 509,586	M	Feb. 3, 1976
481	B 497,021	M	Jan. 13, 1976
482	B 525,809	M	Feb. 24, 1976
527	B 470,170	M	Jan. 13, 1976
546	B 518,999	M	Feb. 3, 1976
765	B 500,945	M	Feb. 24, 1976
Class 75			
.5BA	B 385,631	C	Jan. 27, 1976
84.1R	B 538,491	C	Feb. 17, 1976
101BE	B 452,938	C	Feb. 17, 1976
135	B 525,961	C	Jan. 13, 1976
156.5	B 411,471	C	Feb. 17, 1976
165	B 483,256	C	Feb. 10, 1976
Class 83			
61	B 570,862	M	Feb. 24, 1976
425	B 545,935	M	Jan. 27, 1976
Class 84			
1.1	B 476,568	E	Mar. 16, 1976
1.16	B 556,897	M	Feb. 3, 1976
275	B 504,169	M	Jan. 13, 1976
Class 86			
1R	B 356,187	M	Jan. 20, 1976
Class 93			
58.3	B 548,978	M	Mar. 9, 1976
Class 96			
1R	B 423,883	C	Jan. 27, 1976
1.4	B 200,759	C	Feb. 3, 1976
33	B 437,894	C	Mar. 2, 1976
35	B 524,026	C	Feb. 10, 1976
35.1	B 420,176	C	Mar. 16, 1976
	B 462,893	C	Feb. 24, 1976
	B 530,873	C	Feb. 17, 1976
36.1	B 359,901	C	Jan. 13, 1976
45	B 455,759	C	Feb. 24, 1976
54	B 367,305	C	Mar. 2, 1976
78	B 503,029	C	Jan. 27, 1976
Class 99			
162B	B 432,991	M	Mar. 2, 1976
335	B 557,299	M	Feb. 3, 1976
485	B 311,450	M	Mar. 9, 1976
Class 101			
93.13	B 496,999	M	Jan. 27, 1976
93.14	B 481,600	M	Jan. 27, 1976
115	B 395,554	M	Mar. 9, 1976
129	B 416,589	M	Jan. 27, 1976
401.3	B 494,234	M	Feb. 10, 1976
Class 102			
32	B 405,726	M	Jan. 13, 1976
38	B 279,415	M	Mar. 16, 1976
39	B 417,349	M	Mar. 9, 1976
42R	B 443,163	M	Feb. 3, 1976
69	B 412,068	M	Jan. 13, 1976
Class 106			
27	B 452,883	C	Jan. 27, 1976
57	B 502,773	C	Jan. 13, 1976
309	B 311,779	C	Feb. 10, 1976
Class 109			
1SB	B 358,427	E	Feb. 3, 1976
Class 110			
8R	B 512,324	M	Feb. 17, 1976

		CAT.	PUB. DATE
Class 114			
16.6	B 546,922	M	Mar. 16, 1976
67A	B 489,550	M	Mar. 16, 1976
144R	B 529,659	M	Feb. 24, 1976
230	B 484,769	M	Mar. 16, 1976
Class 116			
124L	B 469,228	M	Feb. 17, 1976
124.4	B 467,412	M	Jan. 13, 1976
Class 118			
637	B 563,301	M	Feb. 17, 1976
Class 123			
8.45	B 570,172	M	Feb. 3, 1976
25R	B 447,440	M	Feb. 17, 1976
32SP	B 467,486	M	Mar. 16, 1976
75B	B 563,780	M	Feb. 3, 1976
122AC	B 498,951	M	Mar. 2, 1976
148E	B 480,473	M	Mar. 2, 1976
182	B 558,251	M	Jan. 13, 1976
191S	B 466,906	M	Mar. 16, 1976
325T	B 425,588	M	Jan. 13, 1976
Class 126			
271	B 512,745	M	Jan. 13, 1976
350A	B 537,903	M	Jan. 20, 1976
Class 128			
2.6R	B 534,574	M	Feb. 24, 1976
260	B 520,277	M	Feb. 17, 1976
	B 524,121	M	Feb. 3, 1976
419P	B 535,466	M	Jan. 27, 1976
419PG	B 533,259	M	Feb. 24, 1976
Class 131			
144	B 586,387	M	Feb. 3, 1976
514.4	B 586,380	M	Mar. 2, 1976
Class 136			
26	B 511,665	C	Mar. 2, 1976
86R	B 505,126	C	Feb. 10, 1976
	B 574,128	C	Feb. 17, 1976
89	B 510,677	C	Feb. 24, 1976
148	B 524,464	C	Feb. 10, 1976
202	B 378,513	C	Jan. 27, 1976
205	B 399,632	C	Mar. 9, 1976
Class 137			
255	B 508,940	M	Feb. 17, 1976
596.12	B 514,687	M	Jan. 27, 1976
608	B 490,623	M	Mar. 2, 1976
614.11	B 530,605	M	Feb. 3, 1976
625.46	B 528,756	M	Feb. 3, 1976
798	B 430,172	M	Jan. 13, 1976
Class 139			
122R	B 527,171	M	Mar. 9, 1976
Class 140			
92.1	B 590,158	M	Feb. 10, 1976
	B 590,159	M	Feb. 3, 1976
Class 141			
294	B 473,813	M	Mar. 9, 1976
Class 144			
32R	B 484,332	M	Mar. 2, 1976
34R	B 521,793	M	Feb. 24, 1976
241	B 545,630	M	Jan. 27, 1976
Class 148			
1.5	B 518,226	C	Feb. 10, 1976
23	B 527,972	C	Mar. 9, 1976
36	B 459,381	C	Mar. 9, 1976
187	B 554,164	C	Mar. 9, 1976
Class 150			
3	B 461,250	M	Mar. 16, 1976
Class 152			
213R	B 445,690	M	Feb. 3, 1976
Class 156			
3	B 453,031	C	Mar. 16, 1976
	B 563,722	C	Jan. 13, 1976
66	B 497,584	C	Feb. 24, 1976
71	B 456,148	C	Jan. 13, 1976
73.6	B 414,481	C	Jan. 20, 1976
143	B 462,386	C	Jan. 13, 1976
159	B 339,446	C	Feb. 24, 1976
435	B 475,385	C	Mar. 9, 1976
608	B 584,997	C	Mar. 9, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
Class 160			
229R	B 505,813	M	Jan. 13, 1976
Class 162			
5	B 491,673	C	Feb. 17, 1976
133	B 431,072	C	Jan. 20, 1976
198	B 150,142	C	Jan. 27, 1976
290	B 478,739	C	Feb. 17, 1976
Class 164			
26	B 499,227	M	Jan. 27, 1976
57	B 488,756	M	Mar. 16, 1976
60	B 511,885	M	Jan. 27, 1976
282	B 396,916	M	Mar. 2, 1976
330	B 522,038	M	Feb. 3, 1976
Class 165			
4	B 328,116	M	Mar. 9, 1976
13	B 543,078	M	Feb. 17, 1976
Class 166			
224	B 492,120	M	Feb. 24, 1976
272	B 569,519	M	Feb. 3, 1976
303	B 529,836	M	Feb. 3, 1976
311	B 511,156	M	Jan. 27, 1976
Class 172			
719	B 97,259	M	Mar. 9, 1976
Class 173			
104	B 537,709	M	Jan. 13, 1976
170	B 567,058	M	Jan. 13, 1976
Class 174			
52R	B 492,902	E	Feb. 24, 1976
68.5	B 509,772	E	Mar. 16, 1976
Class 176			
20R	B 384,330	C	Jan. 27, 1976
36R	B 367,621	C	Feb. 3, 1976
68	B 396,164	C	Feb. 3, 1976
Class 178			
6	B 546,426	E	Jan. 27, 1976
7.1	B 468,100	E	Mar. 9, 1976
	B 519,979	E	Feb. 3, 1976
7.3D	B 442,970	E	Feb. 3, 1976
7.3DC	B 561,770	E	Mar. 16, 1976
7.5R	B 508,817	E	Feb. 3, 1976
58R	B 399,908	C	Jan. 13, 1976
66R	B 498,775	E	Mar. 2, 1976
88	B 561,764	E	Jan. 27, 1976
Class 179			
1A	B 513,756	E	Feb. 3, 1976
1CN	B 475,681	E	Jan. 20, 1976
1SM	B 476,577	E	Jan. 20, 1976
1G	B 554,594	E	Jan. 20, 1976
1.5FS	B 504,899	E	Mar. 9, 1976
7.1R	B 545,050	E	Jan. 20, 1976
15AL	B 496,500	E	Feb. 3, 1976
81R	B 472,284	E	Jan. 13, 1976
170D	B 541,415	E	Feb. 3, 1976
Class 180			
5R	B 499,171	M	Jan. 27, 1976
44F	B 432,969	M	Mar. 2, 1976
49	B 433,094	M	Jan. 27, 1976
53R	B 551,527	M	Jan. 13, 1976
79.2R	B 533,968	M	Jan. 27, 1976
103	B 490,647	M	Feb. 24, 1976
Class 187			
1R	B 436,724	M	Feb. 24, 1976
Class 188			
71.1	B 535,411	M	Feb. 24, 1976
73.6	B 533,056	M	Jan. 13, 1976
165	B 567,435	M	Feb. 3, 1976
218XL	B 562,698	M	Jan. 13, 1976
Class 192			
3.57	B 548,719	M	Feb. 17, 1976
4A	B 531,267	M	Feb. 24, 1976
46	B 522,080	M	Mar. 16, 1976
Class 195			
1.8	B 530,255	E	Mar. 2, 1976
	B 514,839	C	Mar. 2, 1976
29	B 418,489	C	Jan. 13, 1976
65	B 566,585	C	Mar. 2, 1976
	B 592,146	C	Mar. 2, 1976
68	B 395,975	C	Mar. 2, 1976
103.5R	B 452,879	C	Mar. 16, 1976
Class 196			
14.52	B 520,384	M	Jan. 27, 1976
Class 197			
17	B 501,122	M	Feb. 17, 1976
18	B 535,391	M	Jan. 27, 1976
Class 198			
38	B 495,402	M	Feb. 17, 1976
129	B 503,521	M	Mar. 16, 1976
	B 569,646	M	Jan. 13, 1976
179	B 424,989	M	Feb. 3, 1976
202	B 499,352	M	Jan. 27, 1976
Class 200			
5R	B 579,104	E	Jan. 27, 1976
11TC	B 531,425	E	Feb. 3, 1976
16C	B 480,740	E	Mar. 2, 1976
38FA	B 494,383	E	Feb. 3, 1976
61.41	B 506,286	E	Jan. 20, 1976
67D	B 585,247	E	Feb. 3, 1976
83SA	B 428,877	E	Jan. 27, 1976
84C	B 453,533	E	Feb. 17, 1976
309	B 470,899	E	Mar. 2, 1976
339	B 466,390	E	Feb. 24, 1976
Class 202			
227	B 513,280	C	Jan. 20, 1976
Class 204			
9	B 462,424	C	Feb. 24, 1976
15	B 542,135	C	Feb. 10, 1976
158HA	B 550,744	C	Feb. 17, 1976
159.18	B 498,205	C	Feb. 10, 1976
159.22	B 423,404	C	Mar. 2, 1976
163R	B 526,447	C	Feb. 24, 1976
181	B 167,470	C	Mar. 2, 1976
195P	B 511,002	C	Mar. 2, 1976
195S	B 843,038	C	Feb. 3, 1976
224M	B 534,314	C	Feb. 10, 1976
Class 206			
451	B 371,912	M	Mar. 2, 1976
455	B 490,067	M	Jan. 27, 1976
Class 208			
15	B 437,596	C	Jan. 27, 1976
59	B 508,118	C	Feb. 17, 1976
78	B 467,250	C	Feb. 3, 1976
208R	B 508,119	C	Feb. 17, 1976
210	B 501,317	C	Jan. 13, 1976
253	B 438,916	C	Jan. 13, 1976
Class 210			
22R	B 525,204	C	Mar. 16, 1976
23H	B 364,797	C	Feb. 17, 1976
	B 524,806	C	Mar. 2, 1976
24	B 452,501	C	Mar. 16, 1976
130	B 532,901	C	Jan. 13, 1976
189	B 492,716	C	Mar. 2, 1976
321A	B 470,601	C	Mar. 9, 1976
512R	B 330,719	C	Mar. 16, 1976
Class 214			
1C	B 453,238	M	Mar. 2, 1976
18N	B 373,344	M	Feb. 3, 1976
58	B 555,772	M	Jan. 13, 1976
152	B 480,604	M	Jan. 13, 1976
Class 215			
216	B 541,015	M	Jan. 27, 1976
Class 219			
69M	B 426,227	E	Mar. 2, 1976
121EM	B 479,502	E	Mar. 16, 1976
201	B 451,248	E	Mar. 2, 1976
233	B 463,388	E	Feb. 10, 1976
273	B 403,507	E	Feb. 10, 1976
553	B 513,027	E	Feb. 17, 1976
Class 220			
23.83	B 529,156	M	Jan. 13, 1976
66	B 223,678	M	Mar. 9, 1976
288	B 516,032	M	Jan. 27, 1976
337	B 578,447	M	Jan. 20, 1976
Class 221			
75	B 510,281	M	Mar. 9, 1976
Class 222			
43	B 497,853	M	Feb. 17, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
56	B 559,697	M	Mar. 16, 1976
67	B 521,480	M	Jan. 13, 1976
136	B 487,260	M	Jan. 27, 1976
181	B 562,601	M	Mar. 16, 1976
306	B 559,954	M	Feb. 3, 1976
325	B 515,303	M	Jan. 20, 1976
Class 226			
1	B 506,624	M	Mar. 9, 1976
21	B 504,778	M	Feb. 24, 1976
68	B 506,926	M	Feb. 17, 1976
Class 228			
190	B 473,972	M	Jan. 13, 1976
Class 229			
2.5	B 537,990	M	Jan. 13, 1976
17R	B 461,257	M	Jan. 13, 1976
62.5	B 429,157	M	Jan. 27, 1976
Class 235			
151	B 491,650	E	Mar. 9, 1976
151.1	B 520,063	E	Mar. 2, 1976
	B 520,075	E	Feb. 24, 1976
	B 520,076	E	Mar. 2, 1976
151.11	B 540,767	E	Mar. 16, 1976
151.34	B 492,946	E	Jan. 27, 1976
152	B 484,121	E	Mar. 16, 1976
	B 559,737	E	Jan. 20, 1976
154	B 534,016	E	Feb. 3, 1976
156	B 536,009	E	Jan. 27, 1976
175	B 560,488	E	Mar. 16, 1976
181	B 520,924	E	Jan. 27, 1976
Class 236			
13	B 502,652	M	Feb. 24, 1976
15A	B 558,813	M	Feb. 3, 1976
Class 239			
265.39	B 567,892	M	Mar. 16, 1976
424	B 580,921	M	Jan. 13, 1976
	B 586,215	M	Jan. 20, 1976
652	B 520,534	M	Feb. 17, 1976
Class 240			
41.35R	B 454,283	E	Feb. 3, 1976
Class 241			
46.11	B 462,828	M	Mar. 9, 1976
81	B 425,462	M	Mar. 9, 1976
Class 242			
43R	B 521,600	M	Jan. 27, 1976
56R	B 535,448	M	Mar. 16, 1976
107.4A	B 487,427	M	Mar. 2, 1976
129.8	B 506,167	M	Feb. 10, 1976
Class 244			
3.27	B 510,521	M	Mar. 2, 1976
134R	B 535,928	M	Jan. 13, 1976
140	B 419,173	M	Mar. 9, 1976
169	B 423,441	M	Feb. 17, 1976
	B 511,346	M	Jan. 27, 1976
Class 248			
205R	B 520,952	M	Mar. 16, 1976
49	B 398,488	M	Feb. 24, 1976
73	B 494,806	M	Feb. 3, 1976
Class 249			
135	B 548,155	M	Jan. 13, 1976
Class 250			
210	B 515,908	E	Jan. 20, 1976
227	B 522,577	E	Jan. 27, 1976
	B 560,765	E	Feb. 3, 1976
231SE	B 503,618	E	Mar. 9, 1976
291	B 500,981	E	Jan. 27, 1976
303	B 536,082	E	Mar. 16, 1976
328	B 71,613	E	Mar. 16, 1976
364	B 526,190	E	Feb. 17, 1976
402	B 451,534	E	Jan. 13, 1976
445T	B 574,616	E	Mar. 2, 1976
564	B 566,572	E	Mar. 16, 1976
577	B 507,396	E	Feb. 10, 1976
Class 251			
1B	B 541,710	M	Feb. 24, 1976
58	B 429,434	M	Feb. 17, 1976
129	B 534,333	M	Feb. 17, 1976
319	B 490,589	M	Feb. 3, 1976

		CAT.	PUB. DATE
Class 252			
12	B 559,142	C	Mar. 2, 1976
33.6	B 441,723	C	Mar. 16, 1976
105	B 479,969	C	Mar. 9, 1976
156	B 520,546	C	Mar. 2, 1976
182	B 471,405	C	Feb. 10, 1976
301.1W	B 548,058	C	Feb. 17, 1976
301.4S	B 535,813	C	Jan. 27, 1976
301.2W	B 528,297	C	Mar. 16, 1976
364	B 370,309	C	Jan. 20, 1976
404	B 569,125	C	Feb. 24, 1976
408R	B 544,476	C	Feb. 24, 1976
429R	B 457,850	C	Feb. 10, 1976
432	B 509,640	C	Feb. 17, 1976
454	B 450,967	C	Jan. 13, 1976
500	B 479,242	C	Feb. 17, 1976
518	B 585,731	C	Feb. 3, 1976
543	B 403,766	C	Feb. 10, 1976
Class 254			
186R	B 511,407	M	Feb. 10, 1976
188	B 437,559	M	Feb. 3, 1976
190R	B 489,685	M	Feb. 24, 1976
Class 259			
4	B 486,614	N	Feb. 17, 1976
191	B 397,674	M	Mar. 16, 1976
	B 556,057	M	Jan. 13, 1976
Class 260			
2.5AC	B 497,194	C	Feb. 3, 1976
	B 537,102	C	Jan. 13, 1976
2.5AJ	B 557,856	C	Feb. 10, 1976
2.5AM	B 422,063	C	Feb. 3, 1976
2.5AR	B 483,606	C	Jan. 27, 1976
	B 502,589	C	Jan. 27, 1976
2.5AV	B 460,441	C	Jan. 13, 1976
2.5AW	B 483,762	C	Feb. 10, 1976
	B 486,828	C	Mar. 2, 1976
2.5B	B 554,380	C	Mar. 9, 1976
2.5R	B 471,579	C	Jan. 13, 1976
17R	B 510,998	C	Feb. 10, 1976
	B 519,487	C	Feb. 17, 1976
17.4ST	B 530,580	C	Mar. 2, 1976
18TN	B 528,303	C	Feb. 10, 1976
23H	B 54,859	C	Feb. 17, 1976
23XA	B 483,865	C	Jan. 13, 1976
28P	B 489,331	C	Feb. 17, 1976
28R	B 507,456	C	Mar. 9, 1976
28.5AS	B 501,540	C	Jan. 13, 1976
29.2EP	B 455,686	C	Mar. 2, 1976
	B 522,629	C	Mar. 16, 1976
	B 526,997	C	Jan. 13, 1976
29.2TN	B 414,266	C	Feb. 10, 1976
29.6N	B 494,440	C	Feb. 17, 1976
29.6TA	B 494,450	C	Feb. 17, 1976
30.4R	B 485,060	C	Feb. 17, 1976
32.6R	B 596,692	C	Feb. 17, 1976
33.6AQ	B 520,658	C	Mar. 9, 1976
	B 657,438	C	Jan. 20, 1976
33.6R	B 479,175	C	Feb. 17, 1976
33.8UA	B 497,780	C	Feb. 24, 1976
37EP	B 423,365	C	Feb. 17, 1976
	B 441,605	C	Feb. 3, 1976
37R	B 465,955	C	Feb. 3, 1976
40P	B 485,188	C	Mar. 16, 1976
42.15	B 257,143	C	Mar. 16, 1976
	B 415,122	C	Feb. 10, 1976
42.18	B 519,095	C	Feb. 24, 1976
45.75W	B 561,387	C	Feb. 10, 1976
45.8N	B 506,648	C	Feb. 3, 1976
45.85R	B 236,342	C	Feb. 10, 1976
46.5UA	B 528,962	C	Feb. 24, 1976
	B 528,966	C	Feb. 24, 1976
47EP	B 440,633	C	Feb. 10, 1976
63UY	B 470,576	C	Feb. 24, 1976
75N	B 521,125	C	Feb. 10, 1976
	B 521,126	C	Feb. 10, 1976
	B 521,127	C	Feb. 17, 1976
	B 521,128	C	Feb. 10, 1976
	B 552,489	C	Feb. 10, 1976
77.5AN	B 474,645	C	Mar. 2, 1976
77.5CR	B 306,668	C	Feb. 3, 1976
78.5R	B 437,209	C	Feb. 3, 1976
78S	B 451,308	C	Feb. 17, 1976
79.5P	B 546,149	C	Mar. 2, 1976
80.78	B 271,743	C	Mar. 16, 1976
82.1	B 443,563	C	Feb. 24, 1976
88.2C	B 417,014	C	Jan. 13, 1976
88.2F	B 632,416	C	Mar. 9, 1976
93.5A	B 530,174	C	Feb. 24, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
112.5R	B471,617	C	Feb. 10, 1976
	B503,817	C	Jan. 13, 1976
	B520,514	C	Mar. 9, 1976
117	B333,247	C	Mar. 16, 1976
140R	B503,579	C	Feb. 10, 1976
143	B419,582	C	Mar. 2, 1976
147	B383,697	C	Feb. 17, 1976
156	B411,624	C	Mar. 16, 1976
210AB	B554,291	C	Mar. 9, 1976
239A	B349,370	C	Jan. 27, 1976
239D	B520,256	C	Jan. 13, 1976
	B536,935	C	Jan. 13, 1976
239B	B470,900	C	Mar. 2, 1976
239D	B487,423	C	Mar. 2, 1976
239.1	B372,016	C	Mar. 9, 1976
	B538,753	C	Feb. 10, 1976
	B547,208	C	Feb. 24, 1976
239.3A	B506,148	C	Feb. 3, 1976
240A	B484,067	C	Feb. 17, 1976
240G	B482,709	C	Feb. 24, 1976
243C	B442,810	C	Feb. 24, 1976
	B473,039	C	Feb. 10, 1976
	B473,040	C	Feb. 10, 1976
	B516,047	C	Feb. 10, 1976
	B516,296	C	Feb. 3, 1976
	B526,096	C	Feb. 3, 1976
244R	B348,433	C	Feb. 3, 1976
247.1R	B457,931	C	Mar. 16, 1976
247.7T	B468,052	C	Feb. 10, 1976
248NS	B537,711	C	Jan. 13, 1976
249.6	B344,669	C	Mar. 16, 1976
250BC	B491,883	C	Feb. 3, 1976
251A	B480,625	C	Feb. 24, 1976
256.4C	B435,617	C	Mar. 16, 1976
256.4Q	B503,345	C	Feb. 24, 1976
256.5R	B531,096	C	Feb. 10, 1976
268BF	B490,946	C	Feb. 17, 1976
268TR	B539,374	C	Mar. 9, 1976
	B563,070	C	Mar. 9, 1976
274SA	B494,944	C	Feb. 17, 1976
285.5	B530,318	C	Jan. 13, 1976
287C	B492,039	C	Feb. 24, 1976
287D	B571,638	C	Mar. 9, 1976
288R	B402,162	C	Mar. 2, 1976
290R	B445,493	C	Mar. 2, 1976
293.52	B552,508	C	Mar. 16, 1976
293.54	B545,464	C	Feb. 10, 1976
293.56	B447,000	C	Feb. 3, 1976
293.57	B426,802	C	Feb. 17, 1976
294.8D	B526,510	C	Jan. 20, 1976
294.8G	B445,166	C	Mar. 2, 1976
294.9	B494,339	C	Mar. 16, 1976
295.5A	B515,642	C	Feb. 24, 1976
	B545,299	C	Feb. 24, 1976
295.5B	B458,617	C	Feb. 3, 1976
296R	B477,252	C	Jan. 13, 1976
306.7C	B385,024	C	Feb. 10, 1976
307D	B486,280	C	Feb. 3, 1976
307H	B471,836	C	Feb. 24, 1976
	B554,848	C	Feb. 24, 1976
308A	B488,111	C	Jan. 13, 1976
308D	B532,005	C	Feb. 24, 1976
308R	B471,494	C	Mar. 16, 1976
309.2	B407,014	C	Mar. 16, 1976
	B522,567	C	Feb. 17, 1976
	B542,158	C	Jan. 13, 1976
310R	B535,437	C	Feb. 24, 1976
314.5	B426,266	C	Mar. 2, 1976
325PH	B440,548	C	Mar. 16, 1976
326R	B486,678	C	Mar. 2, 1976
	B398,084	C	Feb. 3, 1976
326.5B	B276,026	C	Feb. 3, 1976
326.5FN	B484,269	C	Feb. 10, 1976
326.9	B477,481	C	Feb. 3, 1976
326.12R	B446,107	C	Mar. 9, 1976
326.13R	B456,869	C	Mar. 9, 1976
327C	B480,452	C	Feb. 10, 1976
330.5	B552,498	C	Jan. 13, 1976
	B574,996	C	Feb. 17, 1976
340.5	B504,877	C	Feb. 24, 1976
340.9	B476,372	C	Feb. 24, 1976
	B521,643	C	Mar. 2, 1976
343.2R	B491,032	C	Feb. 10, 1976
343.3	B536,675	C	Jan. 20, 1976
343.3R	B495,550	C	Feb. 3, 1976
	B495,554	C	Feb. 3, 1976
345.9	B450,701	C	Mar. 16, 1976
	B450,708	C	Mar. 9, 1976
346.2M	B440,858	C	Feb. 3, 1976
	B302,160	C	Feb. 3, 1976
346.4	B485,051	C	Feb. 17, 1976
348.5L	B521,324	C	Jan. 27, 1976
348.6	B546,295	C	Jan. 20, 1976
378	B431,713	C	Feb. 10, 1976
397.4	B450,693	C	Mar. 9, 1976
	B484,068	C	Mar. 2, 1976
429.7	B464,587	C	Feb. 3, 1976
429.9	B455,481	C	Feb. 24, 1976
438.1	B518,656	C	Feb. 17, 1976
448.2H	B390,408	C	Feb. 3, 1976
448.2N	B551,463	C	Feb. 17, 1976
456NS	B484,419	C	Mar. 9, 1976
465.5R	B747,785	C	Feb. 10, 1976
465.7	B564,252	C	Mar. 2, 1976
465.9	B456,900	C	Feb. 3, 1976
	B530,925	C	Feb. 24, 1976
471R	B385,483	C	Feb. 17, 1976
	B388,521	C	Jan. 13, 1976
472	B472,256	C	Jan. 13, 1976
	B491,052	C	Mar. 2, 1976
473S	B532,140	C	Mar. 2, 1976
483	B410,074	C	Feb. 24, 1976
493	B351,455	C	Feb. 24, 1976
501.12	B544,899	C	Feb. 17, 1976
513R	B494,669	C	Feb. 3, 1976
515A	B390,031	C	Jan. 13, 1976
516	B386,828	C	Feb. 3, 1976
527R	B467,328	C	Mar. 9, 1976
534R	B301,143	C	Jan. 27, 1976
544C	B471,116	C	Feb. 17, 1976
553R	B391,473	C	Mar. 2, 1976
554	B529,974	C	Feb. 17, 1976
557R	B386,257	C	Feb. 3, 1976
561R	B513,781	C	Feb. 24, 1976
562B	B413,379	C	Mar. 9, 1976
566A	B513,014	C	Feb. 10, 1976
567.6M	B480,114	C	Mar. 2, 1976
568	B529,974	C	Feb. 17, 1976
578	B449,837	C	Mar. 2, 1976
580	B503,742	C	Feb. 17, 1976
586C	B438,484	C	Feb. 17, 1976
591	B416,257	C	Mar. 16, 1976
593R	B468,350	C	Jan. 13, 1976
598	B465,202	C	Feb. 24, 1976
601R	B208,916	C	Jan. 13, 1976
604HF	B472,241	C	Feb. 17, 1976
609E	B474,573	C	Jan. 20, 1976
621H	B501,128	C	Feb. 24, 1976
621K	B470,348	C	Jan. 13, 1976
632R	B553,584	C	Feb. 17, 1976
637R	B519,446	C	Feb. 24, 1976
643R	B480,662	C	Mar. 2, 1976
647	B394,248	C	Jan. 27, 1976
648F	B330,736	C	Feb. 3, 1976
665R	B460,846	C	Feb. 24, 1976
668D	B430,157	C	Feb. 17, 1976
674SA	B426,274	C	Jan. 20, 1976
683.15D	B428,103	C	Feb. 10, 1976
683.48	B526,027	C	Feb. 17, 1976
859R	B519,485	C	Feb. 10, 1976
873	B465,688	C	Jan. 27, 1976
	B519,486	C	Feb. 17, 1976
876B	B575,851	C	Feb. 10, 1976
876R	B589,966	C	Feb. 17, 1976
	B461,184	C	Feb. 17, 1976
	B580,826	C	Feb. 17, 1976
	B589,966	C	Feb. 17, 1976
878R	B469,468	C	Mar. 16, 1976
880B	B510,458	C	Feb. 10, 1976
884	B456,579	C	Feb. 10, 1976
890	B495,408	C	Feb. 3, 1976
927N	B369,221	C	Feb. 24, 1976
929	B502,993	C	Feb. 17, 1976
937	B512,373	C	Feb. 10, 1976
940	B496,430	C	Feb. 10, 1976
942	B386,673	C	Feb. 3, 1976
948	B534,591	C	Feb. 17, 1976
984	B455,486	C	Mar. 16, 1976
Class 261			
39A	B562,462	C	Jan. 13, 1976
98	B480,702	C	Jan. 27, 1976
Class 264			
36	B308,659	C	Jan. 27, 1976
49	B417,164	C	Mar. 2, 1976
51	B506,144	C	Feb. 10, 1976
	B508,369	C	Jan. 13, 1976
140	B214,925	C	Mar. 9, 1976
161	B555,437	C	Feb. 3, 1976
225	B453,759	C	Jan. 27, 1976
315	B485,169	C	Mar. 16, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
Class 270			
62	B 516,609	M	Feb. 24, 1976
Class 271			
180	B 435,481	M	Mar. 9, 1976
Class 274			
37	B 526,388	M	Feb. 3, 1976
Class 277			
27	B 544,034	M	Feb. 17, 1976
81P	B 515,216	M	Feb. 17, 1976
184	B 426,819	M	Feb. 17, 1976
Class 280			
11.35R	B 435,570	M	Mar. 16, 1976
124F	B 471,706	M	Mar. 16, 1976
150AB	B 520,341	M	Mar. 16, 1976
150.5	B 583,051	M	Feb. 3, 1976
236	B 572,642	M	Feb. 10, 1976
Class 281			
25R	B 491,618	M	Mar. 16, 1976
Class 290			
17	B 477,597	E	Feb. 17, 1976
Class 292			
254	B 549,964	M	Feb. 24, 1976
Class 293			
71P	B 552,932	M	Feb. 3, 1976
Class 296			
35R	B 443,647	M	Feb. 17, 1976
	B 463,671	M	Jan. 13, 1976
Class 298			
35M	B 510,588	M	Jan. 27, 1976
Class 299			
31	B 499,209	M	Feb. 24, 1976
Class 303			
21BE	B 575,583	M	Mar. 16, 1976
Class 305			
27	B 506,566	M	Jan. 20, 1976
Class 307			
88.3	B 540,872	E	Jan. 20, 1976
137	B 466,444	E	Jan. 20, 1976
205	B 444,437	E	Mar. 9, 1976
	B 513,368	E	Feb. 3, 1976
232	B 540,078	E	Jan. 13, 1976
251	B 548,302	E	Feb. 17, 1976
255	B 492,688	E	Jan. 20, 1976
270	B 497,960	E	Jan. 20, 1976
293	B 519,932	E	Feb. 3, 1976
296	B 512,849	E	Feb. 3, 1976
Class 308			
9	B 391,797	M	Mar. 9, 1976
36.3	B 562,413	M	Mar. 16, 1976
207R	B 507,661	M	Mar. 2, 1976
Class 310			
4R	B 539,746	E	Feb. 17, 1976
9.6	B 501,482	E	Jan. 13, 1976
41	B 561,784	E	Jan. 27, 1976
90	B 458,500	E	Feb. 24, 1976
155	B 592,143	C	Jan. 27, 1976
168	B 526,289	E	Feb. 24, 1976
254	B 521,045	E	Feb. 24, 1976
	B 521,046	E	Feb. 24, 1976
259	B 521,044	E	Feb. 24, 1976
Class 313			
42	B 534,443	E	Jan. 27, 1976
60	B 513,706	M	Jan. 13, 1976
94	B 517,762	E	Mar. 16, 1976
99	B 518,859	E	Feb. 3, 1976
273	B 531,929	E	Jan. 20, 1976
330	B 504,056	C	Feb. 24, 1976
	B 520,884	E	Mar. 16, 1976
366	B 515,455	E	Jan. 27, 1976
404	B 523,696	E	Jan. 13, 1976
452	B 160,045	E	Jan. 13, 1976
477	B 279,969	E	Jan. 13, 1976
Class 315			
169TV	B 463,322	E	Jan. 20, 1976
	B 520,613	E	Mar. 16, 1976
241P	B 501,503	E	Mar. 2, 1976
371	B 483,615	E	Jan. 27, 1976
388	B 516,002	E	Jan. 13, 1976
399	B 467,971	E	Jan. 13, 1976
408	B 516,564	E	Feb. 17, 1976
Class 317			
9R	B 488,634	E	Jan. 20, 1976
36TD	B 504,404	E	Feb. 24, 1976
101A	B 420,472	E	Feb. 24, 1976
120	B 527,187	E	Feb. 17, 1976
	B 531,566	M	Mar. 16, 1976
124	B 509,606	E	Feb. 3, 1976
259	B 506,461	E	Jan. 20, 1976
Class 318			
139	B 475,236	E	Feb. 3, 1976
231	B 511,886	E	Feb. 3, 1976
257	B 502,973	E	Jan. 27, 1976
593	B 476,967	E	Mar. 9, 1976
Class 321			
2	B 533,734	E	Jan. 27, 1976
7	B 509,185	E	Feb. 3, 1976
61	B 495,759	E	Feb. 3, 1976
Class 322			
25	B 466,318	E	Mar. 9, 1976
Class 323			
1	B 430,276	E	Jan. 20, 1976
17	B 459,811	E	Jan. 20, 1976
	B 583,089	E	Jan. 27, 1976
22T	B 501,181	E	Feb. 10, 1976
Class 324			
13	B 79,099	E	Jan. 13, 1976
15	B 495,331	E	Mar. 16, 1976
51	B 534,767	E	Feb. 3, 1976
60C	B 540,218	E	Feb. 10, 1976
62	B 465,393	E	Jan. 27, 1976
83D	B 458,010	E	Mar. 16, 1976
158R	B 483,268	E	Mar. 9, 1976
Class 325			
40	B 558,220	E	Jan. 27, 1976
468	B 544,961	E	Jan. 13, 1976
Class 328			
129	B 78,315	E	Feb. 10, 1976
155	B 550,693	E	Jan. 20, 1976
Class 330			
15	B 530,813	E	Feb. 17, 1976
33	B 439,542	E	Jan. 27, 1976
207P	B 553,460	E	Feb. 3, 1976
Class 331			
44ST	B 527,669	E	Jan. 13, 1976
51	B 538,686	E	Jan. 13, 1976
94.5C	B 549,931	E	Jan. 20, 1976
94.5G	B 442,295	E	Mar. 16, 1976
94.5L	B 506,916	E	Feb. 3, 1976
94.5M	B 384,654	E	Feb. 24, 1976
94.5P	B 394,350	E	Jan. 13, 1976
116R	B 527,693	E	Feb. 3, 1976
117R	B 571,219	E	Feb. 24, 1976
Class 332			
9R	B 507,087	E	Feb. 17, 1976
Class 333			
30R	B 453,616	E	Jan. 27, 1976
31A	B 568,770	E	Feb. 10, 1976
72	B 534,991	E	Jan. 27, 1976
73W	B 339,194	E	Feb. 3, 1976
81A	B 493,370	E	Mar. 16, 1976
Class 335			
7	B 509,165	E	Mar. 2, 1976
210	B 541,517	E	Jan. 13, 1976
253	B 515,452	E	Feb. 10, 1976
Class 338			
166	B 489,526	E	Feb. 3, 1976
202	B 528,761	E	Feb. 10, 1976
Class 340			
8L	B 270,274	E	Feb. 17, 1976
146.1AB	B 428,408	E	Mar. 2, 1976
167B	B 568,226	E	Feb. 24, 1976
172.5	B 391,844	E	Mar. 16, 1976
	B 461,336	E	Feb. 3, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
	B 503,780	E	Mar. 16, 1976
	B 482,907	E	Jan. 20, 1976
	B 485,575	E	Feb. 24, 1976
	B 533,454	E	Mar. 2, 1976
173FF	B 495,185	E	Mar. 9, 1976
173R	B 545,945	M	Jan. 27, 1976
174DC	B 443,712	E	Jan. 27, 1976
174TF	B 429,018	C	Feb. 10, 1976
	B 455,425	E	Feb. 3, 1976
	B 472,276	E	Mar. 9, 1976
	B 476,681	E	Jan. 13, 1976
	B 499,718	E	Jan. 27, 1976
198	B 546,665	E	Jan. 20, 1976
347AD	B 507,647	E	Jan. 27, 1976
	B 526,106	E	Jan. 27, 1976
347CC	B 498,500	E	Jan. 20, 1976
Class 343			
7A	B 248,240	E	Jan. 13, 1976
7.7	B 484,029	E	Feb. 10, 1976
8	B 497,702	E	Mar. 2, 1976
840	B 494,691	E	Mar. 16, 1976
100LE	B 488,395	E	Jan. 27, 1976
100LE	B 496,502	E	Jan. 20, 1976
786	B 547,994	E	Jan. 20, 1976
815	B 563,244	E	Jan. 27, 1976
Class 346			
75	B 512,964	E	Feb. 10, 1976
139C	B 560,261	E	Mar. 16, 1976
Class 350			
7	B 469,036	M	Mar. 16, 1976
96WG	B 381,985	M	Feb. 3, 1976
	B 537,722	M	Feb. 3, 1976
103	B 586,663	M	Feb. 3, 1976
150	B 384,225	M	Mar. 16, 1976
160LC	B 527,054	M	Feb. 17, 1976
173	B 469,947	M	Jan. 20, 1976
310	B 520,543	M	Jan. 27, 1976
320	B 548,440	M	Feb. 3, 1976
Class 354			
23D	B 492,774	E	Mar. 9, 1976
46	B 515,135	E	Feb. 17, 1976
70	B 533,580	E	Feb. 3, 1976
156	B 507,131	E	Mar. 2, 1976
174	B 502,161	E	Mar. 2, 1976
288	B 559,111	E	Feb. 24, 1976
298	B 489,328	E	Jan. 20, 1976
Class 355			
8	B 509,474	M	Feb. 17, 1976
16	B 481,048	M	Mar. 16, 1976
17	B 493,501	M	Feb. 3, 1976
Class 356			
103	B 517,504	M	Mar. 9, 1976
201	B 450,521	M	Feb. 17, 1976
239	B 530,569	M	Mar. 16, 1976
Class 357			
16	B 496,487	E	Jan. 20, 1976
22	B 480,749	E	Mar. 9, 1976
	B 504,503	E	Mar. 9, 1976
23	B 516,060	E	Feb. 17, 1976
36	B 508,961	E	Feb. 3, 1976
55	B 480,292	E	Mar. 16, 1976
59	B 535,209	E	Mar. 16, 1976
65	B 470,798	E	Jan. 20, 1976
72	B 481,930	E	Feb. 24, 1976
Class 358			
8	B 554,939	E	Feb. 10, 1976
28	B 73,017	E	Mar. 9, 1976
41	B 502,289	E	Jan. 13, 1976
Class 360			
1	B 484,365	E	Jan. 27, 1976
15	B 283,941	E	Feb. 3, 1976
17	B 461,874	E	Jan. 27, 1976
27	B 427,883	E	Jan. 20, 1976
35	B 347,661	E	Mar. 16, 1976
49	B 516,069	E	Mar. 16, 1976
60	B 453,432	E	Mar. 16, 1976
	B 491,111	E	Feb. 17, 1976
78	B 487,411	E	Feb. 24, 1976
80	B 403,477	E	Feb. 3, 1976
81	B 500,176	E	Feb. 3, 1976
85	B 501,253	E	Feb. 3, 1976
102	B 458,964	E	Mar. 2, 1976
125	B 59,512	E	Mar. 16, 1976
130	B 579,806	E	Feb. 3, 1976
Class 401			
219	B 557,621	M	Feb. 3, 1976
Class 403			
107	B 513,789	M	Feb. 3, 1976
318	B 540,632	M	Jan. 13, 1976
Class 404			
71	B 452,672	M	Jan. 13, 1976
77	B 434,206	M	Feb. 3, 1976
Class 408			
124	B 501,993	M	Jan. 13, 1976
146	B 521,986	M	Feb. 3, 1976
Class 415			
14	B 471,735	M	Feb. 3, 1976
115	B 561,712	C	Feb. 17, 1976
136	B 563,412	M	Feb. 24, 1976
213R	B 512,547	M	Jan. 13, 1976
214	B 552,006	M	Feb. 3, 1976
Class 416			
61	B 549,394	M	Jan. 27, 1976
157B	B 513,346	M	Mar. 9, 1976
Class 423			
15	B 372,722	C	Mar. 9, 1976
238	B 485,401	C	Jan. 27, 1976
242	B 66,272	C	Feb. 24, 1976
244	B 499,324	C	Mar. 16, 1976
249	B 402,553	C	Feb. 17, 1976
283	B 521,984	C	Feb. 17, 1976
315	B 471,221	C	Jan. 13, 1976
390	B 549,198	C	Jan. 13, 1976
393	B 491,455	C	Feb. 3, 1976
406	B 111,130	C	Mar. 16, 1976
448	B 414,028	C	Feb. 17, 1976
462	B 336,754	C	Mar. 16, 1976
471	B 521,612	C	Mar. 9, 1976
580	B 379,177	C	Jan. 27, 1976
Class 424			
9	B 426,424	C	Feb. 3, 1976
45	B 181,208	C	Mar. 9, 1976
62	B 464,593	C	Mar. 9, 1976
115	B 482,660	C	Feb. 10, 1976
118	B 542,226	C	Feb. 24, 1976
122	B 482,058	C	Mar. 2, 1976
	B 524,179	C	Jan. 13, 1976
177	B 490,995	C	Feb. 3, 1976
203	B 576,903	C	Feb. 3, 1976
230	B 487,133	C	Jan. 27, 1976
245	B 493,955	C	Mar. 9, 1976
246	B 399,098	C	Feb. 24, 1976
251	B 450,870	C	Mar. 16, 1976
257	B 374,588	C	Jan. 27, 1976
258	B 426,639	C	Feb. 3, 1976
263	B 466,929	C	Jan. 27, 1976
267	B 307,698	C	Feb. 3, 1976
	B 407,737	C	Feb. 3, 1976
270	B 521,711	C	Feb. 10, 1976
273	B 566,464	C	Feb. 3, 1976
274	B 496,431	C	Jan. 13, 1976
	B 547,547	C	Feb. 24, 1976
281	B 587,786	C	Feb. 17, 1976
311	B 457,862	C	Jan. 27, 1976
317	B 510,850	C	Feb. 3, 1976
362	B 495,489	C	Feb. 3, 1976
Class 425			
222	B 163,463	M	Jan. 27, 1976
237	B 431,334	M	Mar. 16, 1976
384	B 562,813	C	Feb. 3, 1976
521	B 411,765	M	Feb. 24, 1976
	B 548,688	M	Mar. 9, 1976
Class 426			
3	B 583,712	C	Feb. 10, 1976
73	B 493,950	C	Mar. 2, 1976
239	B 572,726	C	Feb. 24, 1976
276	B 535,944	C	Jan. 13, 1976
535	B 560,717	C	Feb. 10, 1976
548	B 439,778	C	Feb. 3, 1976
656	B 478,759	C	Mar. 16, 1976
Class 427			
39	B 476,837	C	Jan. 20, 1976
70	B 381,709	C	Jan. 13, 1976
145	B 457,547	C	Feb. 17, 1976
186	B 537,085	C	Feb. 17, 1976

NOTE.—First number, class; second number, subclass; third number, document number

			CAT.	PUB. DATE
207		B 501,415	C	Jan. 13, 1976
343		B 160,099	C	Jan. 13, 1976
372		B 409,848	C	Jan. 27, 1976
389		B 519,377	C	Jan. 27, 1976
	Class 428			
73		B 481,737	C	Jan. 13, 1976
132		B 333,110	C	Mar. 16, 1976
175		B 468,330	M	Mar. 16, 1976
224		B 378,760	C	Mar. 9, 1976
289		B 402,929	C	Feb. 3, 1976
315		B 373,354	C	Jan. 27, 1976
341		B 450,196	C	Feb. 10, 1976
428		B 554,655	C	Feb. 24, 1976
434		B 457,886	C	Jan. 13, 1976
447		B 456,069	C	Mar. 9, 1976
515		B 474,747	C	Feb. 24, 1976
	Class 431			
175		B 534,313	M	Jan. 27, 1976
264		B 398,220	M	Feb. 3, 1976
	Class 432			
49		B 536,511	M	Mar. 9, 1976

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF MARCH, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Finkl & Sons Company: *See—*
Thiess, Harold C.; and Jahnke, Harold N., 3,944,444.

A/S Fisker & Nielsen: *See—*
Dall, Hans Mathiesen, 3,943,597.

Aarts, Petrus Josef Maria: *See—*
Janssen, Peter Johannes Michiel; and Aarts, Petrus Josef Maria, 3,944,901.

Abe, Takashi: *See—*
Hasunuma, Kyotaro; Kurokawa, Masahiro; and Abe, Takashi, 3,944,550.

Abe, Tsuwao: *See—*
Mizuhara, Yasushi; Abe, Tsuwao; and Hitomi, Hiroyuki, 3,944,475.

Abel, Heinz: *See—*
Hostettler, Hans; Abel, Heinz; and Topfl, Rosemarie, 3,944,385.

Abodagga, Faisal: *See—*
Cherubim, Martin; and Abodagga, Faisal, 3,944,559.

Abraham, Nedumparambil A.; and Lefebvre, Yvon, to American Home Products Corporation. 22-Cyano-24-norcholanes. 3,944,541, Cl. 260-210.500.

Abruzzo, Joseph: *See—*
Caporin, Edward A.; Abruzzo, Joseph; and Rees, Frank L., 3,944,965.

ACF Industries, Incorporated: *See—*
Connelly, Lawrence K.; and Peters, Clifford M., 3,943,974.

Acks, Robert S.; Watson, Stanley J.; and McCracken, Howard B., to United States of America, Navy. Updated diver navigation device. 3,944,967, Cl. 340-6.00R.

Acme Steel Door Corporation: *See—*
Hoenigmann, Gustave, 3,943,667.

Adamovske strojirny: *See—*
Cerny, Arnost, 3,944,218.

Adams, William R., to Sun Chemical Corporation. Keto dioxolanes. 3,944,509, Cl. 260-340.900.

Adas, Charles L., to Detroit Marine Engineering. Ladder. 3,944,024, Cl. 182-194.000.

Adembri, Giorgio; Tedeschi, Piero; Ponticelli, Fabio; and Marini, Maresco, to Etablissements Nativelle, S.A. 1-Amino-pyrazolic derivatives. 3,944,563, Cl. 260-310.00R.

Adkisson, Truman D.: *See—*
Blackstock, Billy J.; and Adkisson, Truman D., 3,944,279.

Aeronutronic Ford Corporation: *See—*
Greenwood, Richard H., 3,944,178.

AGA Aktiebolag: *See—*
Dahlqvist, Jan; Matsson, Bo; and Johansson, Benny, 3,944,730.

AGFA-Gevaert: *See—*
Van Cappellen, Jan Baptist; and Rens, Walter Johannes, 3,944,644.

AGFA-GEVAERT N.V.: *See—*
Muylle, Wilfried Edgard, 3,943,810.

Ahlen, Karl Gustav, to S.R.M. Hydromekanik Aktiebolag. Vehicle transmission with multiple torque convertors. 3,944,034, Cl. 192-3.250.

Ahlstone, Arthur G., to Vetco Offshore Industries, Inc. Retrieving tool for wellhead packing. 3,944,273, Cl. 294-86.100.

Aileo, Jackson A., to Gentex Corporation. Helmet retention system. 3,943,572, Cl. 2-3.00R.

Air Products and Chemicals, Inc.: *See—*
Jones, John Paul, Jr., 3,944,894.

Aisin Seiki Kabushiki Kaisha: *See—*
Ishigami, Noriakira; and Kobayashi, Hideyuki, 3,944,293.
Miyao, Takayuki; Maeda, Hiroaki; and Sato, Masanori, 3,943,715.
Sakamoto, Mitsuhiro, 3,944,198.
Sato, Kenichi, 3,943,798.

Aizawa, Tatsuo: *See—*
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,944,422.

Akazawa, Tadashi: *See—*
Katsushima, Atsuo; Imazu, Shinichi; Fukui, Shoshin; Iwatani, Akitoshi; and Akazawa, Tadashi, 3,944,587.

Akazome, Giichi: *See—*
Naramoto, Isao; Kyuma, Tatsuo; and Akazome, Giichi, 3,944,613.

Akita, Shigeyuki; and Ito, Osamu, to Nippondenso Co., Ltd. Electrical wiring system. 3,944,981, Cl. 340-147.00R.

Akiyama, Takao; Takani, Satoru; and Atsumo, Hideo, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Method and apparatus for continuously measuring hydrogen concentration in argon gas. 3,943,751, Cl. 73-27.00R.

Aktiebolaget Atomenergi: *See—*
Dissing, Erik, 3,944,830.

Aktiebolaget Electrolux: *See—*
Lundin, Lars Erik; and Vieglins, Dzintars Illmars, 3,943,595.

Aktiebolaget IRO: *See—*
Jacobsson, Kurt Arne Gunnar; and Laursen, Ove, 3,944,156.

Aktiebolaget Platmanufaktur: *See—*
Bruke, Richard Leroy; and Larsson, Lars Goran, 3,944,127.

Akzona Incorporated: *See—*
van den Broek, Albertus Joannes; and de Visser, Jacob, 3,944,576.

Albers, Bernd G.: *See—*
Fisher, Howard M.; Albers, Bernd G.; and Mrozek, John W., 3,944,083.

Albertazzi, Gastone, to Finike Italiana Marposs, Soc. In Accomandita Semplice di Mario Possati & C. Apparatus for measuring the length of curvilinear segments. 3,943,632, Cl. 33-174.00L.

Albrecht, Wilhelm, to Daimler-Benz Aktiengesellschaft. Telescopic safety steering column for motor vehicles. 3,944,244, Cl. 280-87.00R.

Alexanian, Ruben Arshakovich: *See—*
Galoian, Armen Anushavanovich; Alexanian, Ruben Arshakovich; and Oganian, Mavra Vagarshanovna, 3,944,665.

Alfa-Laval AB: *See—*
Nordegren, Sven-Ake; and Olander, Karl Erik, 3,943,888.

Allegheny Ludlum Industries, Inc.: *See—*
Chivinsky, Joseph A., 3,944,396.

Allen, Marshall T. Apparatus and method for testing engine oil pressure. 3,943,760, Cl. 73-119.00R.

Allen, Paul T.: *See—*
Horodysky, Andrew G.; and Allen, Paul T., 3,944,539.

Allied Chemical Corporation: *See—*
Gancy, Alan B.; and Poncha, Rustom P., 3,944,500.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Tornblom, Bengt Hj., 3,944,911.

Allport, Maurice James; and Williams, David Gordon, to Lucas Electrical Company Limited, The. Battery charging systems for road vehicles. 3,944,905, Cl. 320-48.000.

Almqvist, Arne Gustav Edvard. Device for supporting elongated light fixtures on drawing boards. 3,944,802, Cl. 240-2.00D.

Altenpohl, William F., to W. F. Altenpohl, Inc. (Entire). Counter controlled product conveyor distribution system. 3,944,078, Cl. 209-73.000.

Alterman, David S.; and Chun, Kil Whan, to Lever Brothers Company. Detergent composition containing coated bleach particles. 3,944,497, Cl. 252-96.000.

Aluminum Company of America: *See—*
Urbanic, John M.; and Major, Burney A., 3,944,781.

Alvey, Inc.: *See—*
Schuette, Thomas J.; and Turnbough, Harold L., 3,944,057.

Alvin, Pierre L. Rotary brush for road-cleaning machines. 3,943,594, Cl. 15-180.000.

ALZA Corporation: *See—*
Bashaw, John D.; Zaffaroni, Alejandro; and Michaels, Alan S., 3,944,064.

American Cyanamid Company: *See—*
Asato, Goro, 3,944,567.
Fetchin, John Allan; and Marzluff, William Frank, 3,944,609.
Kazan, John, 3,944,616.
Ruckel, Erwin Richard, 3,944,624.
Singh, Balwant, 3,944,608.
Singh, Balwant, 3,944,617.
Singh, Balwant, 3,944,618.
Singh, Balwant, 3,944,619.

American Home Products Corporation: *See—*
Abraham, Nedumparambil A.; and Lefebvre, Yvon, 3,944,541.
Teller, Daniel M.; Sellstedt, John H.; and Guinosso, Charles J., 3,944,580.

American Hospital Supply Corporation: *See—*
Mueller, Floyd F., 3,944,205.

American Kennel Club: *See—*
Hildebrand, George, 3,943,630.

American Magnetics, Inc.: *See—*
Efferson, Kenneth R., 3,943,767.

American Optical Corporation: *See—*
Shindler, Anthony, 3,944,346.

American Safety Equipment Corporation: *See—*
Henderson, Cyril, 3,944,162.

Amex Systems, Inc.: *See—*
Oberdiear, Robert C., 3,944,317.

AMF Incorporated: *See—*
Sherwood, John R., 3,944,819.

Amis, Peter William: *See—*
Chambers, Roger Nicolas Crovo; and Amis, Peter William, 3,944,922.

AMP Incorporated: *See—*
Conway, David, 3,944,889.

Ampex Corporation: *See—*
Herzog, William Frederic, 3,944,949.

Andermac, Inc.: *See—*
McLaughlin, Jack E., 3,943,750.

Anderson, Donald: *See—*
Jones, Neal K.; Langford, Aubrey F. W.; Anderson, Donald; and Crook, Walter R., 3,944,806.

Anderson, John M.: *See—*
Gerlach, Charles R., 3,944,634.

Anderson, Robert Craig; and Herd, Alan James, to Imperial Chemical Industries Limited. Smoking mixtures. 3,943,942, Cl. 131-17.00R.

Andersson, Rune, to Linden Alimak AB. Control arrangement, preferably for remote controlled, hydrostatically operated hoist machineries. 3,943,716, Cl. 60-444.000.

Andoh, Shizuo: *See—*
Murase, Kenji; and Andoh, Shizuo, 3,944,740.

Andrasfalvy, Kalman. Powder reclamation device for electrostatic powder coating systems. 3,944,404, Cl. 55-294.000.

Andrianov, Kuzma Andrianovich; and Makarova, Natalia Nikolaevna. Cyclolinear polyorganosiloxanes and method for preparing same. 3,944,520, Cl. 260-46.50R.

Angel, Yves; and Mai Van Duc, Duc, to U.S. Philips Corporation. Magnetic detection means for sensing mobile ferromagnetic masses including pulse shaper circuit for generating a single pulse output. 3,944,912, Cl. 324-41.000.

Ann Arbor Baler Company: *See—*
Standbridge, Wilbur R.; Butler, Larry D.; and Sivy, William H., 3,943,844.

Anthony, Philip L., to Rockwell International Corporation. Elastomeric post array mounting structure. 3,944,181, Cl. 248-358.00R.

Antol, Ronald F.: *See—*
Frantti, Edsel W.; and Antol, Ronald F., 3,944,807.

APAG Apparatebau AG: *See—*
Dosch, Peter; and Dorsch, Dieter, 3,943,692.

Applied Research Laboratories Limited: *See—*
Gray, Alan Lyle, 3,944,826.

Apsit, Voldemar Voldemarovich; Dombur, Lev Eduardovich; Lutsavs, Yan Yanovich; Pugachev, Vladislav Alexandrovich; Schukin, Mikhail Ivanovich; Dirzhis, Sauljus Antanovich; Karosas, Iozas Ionovich; Pashtukas, Algis Vladislavovich; and Khlavnovich, Leonid Borisovich. Inductor machine. 3,944,863, Cl. 310-168.000.

Arai, Hiroshi; Watanabe, Yohei; Ohta, Jun; Higo, Nobumasa; and Sakurai, Yasuhiko, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Central warning apparatus for vehicles. 3,944,969, Cl. 340-52.00F.

Archer, Robert A., to Eli Lilly and Company. Hexahydro-dibenzo[b,d]pyran-9-ones as analgesic drugs. 3,944,673, Cl. 424-283.000.

Arco Medical Products Company: *See—*
Hursen, Thomas F.; Kolenik, Steven A.; and Purdy, David L., 3,944,438.

Argade, Shyam D., to BASF Wyandotte Corporation. Diaphragm for electrolytic cell for chlorine production. 3,944,477, Cl. 204-266.000.

Arii, Mitsuru; Kashiwaya, Hideo; and Uchida, Kuniharu, to Tokyo Shibaura Electric Co., Ltd. Method and apparatus for measuring the magnitude of a clamping load applied to a laminated iron core of an electric machine. 3,943,755, Cl. 73-67.50R.

Arkawa Rinsan Kagaku Kogyo Kabushiki Kaisha: *See—*
Ishibe, Shuhei; Okumichi, Toshiharu; and Matsumoto, Keizo, 3,944,532.

Arnold, Francis T.: *See—*
Freeman, Lawrence M.; and Arnold, Francis T., 3,944,148.

Arnold, Fred E.: *See—*
Hedberg, Frederick L.; and Arnold, Fred E., 3,944,614.
Villaescusa, Frank W.; Breland, John G.; and Arnold, Fred E., 3,944,575.

Arnold, James F., to HydroTech International, Inc. Dynamic pipe coupling. 3,944,263, Cl. 285-96.000.

Arrighi, Victor L.: *See—*
Newman, Albert P.; and Arrighi, Victor L., 3,944,316.

Arthur D. Little, Inc.: *See—*
Haggerty, John S.; Menashi, Wilson P.; and Wenckus, Joseph F., 3,944,640.

Artmann, John A.: *See—*
Samhammer, Clair A.; Ellsworth, Arthur W.; Sullivan, James P.; Artmann, John A.; and Null, Robert A., 3,944,032.

Arumugham, Rangaswamy; Kruszewski, William Frank; and Siwko, Karol, to GTE Sylvania Incorporated. Wide band automatic frequency control circuit. 3,944,725, Cl. 178-5.8AF.

Arvizu Barragan, Oscar. Wholly disposable dental type syringe. 3,943,926, Cl. 128-218.0DA.

Aryamane, Avinash; and Kruse, Marvin A., to Littelfuse, Inc. Rocker switch. 3,944,768, Cl. 200-67.00G.

Asahi Glass Company Ltd.: *See—*
Hirota, Ryuichi; Kakuta, Hisashi; Motoba, Shigetado; Shimizu, Kenichi; Kanno, Ryoichi; and Narita, Mitsuaki, 3,944,650.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Kawasaki, Masahiro, 3,944,370.

Asanuma, Yasuaki: *See—*
Kaneko, Masayasu; Ohshima, Syunji; and Asanuma, Yasuaki, 3,944,930.

Asato, Goro, to American Cyanamid Company. Benzothienylisocyanates and isothiocyanates and method of preparation thereof. 3,944,567, Cl. 260-332.500.

Asberg, Sture Lennart, to SKF Nova AB. Roller bearing provided with flanges. 3,944,305, Cl. 308-187.100.

Ashton, William Howard; and Russell, Robert Schenke, to Johnson & Johnson. Flavored dental articles. 3,943,949, Cl. 132-89.000.

Asoyants, Grigory Bagradovich: *See—*
Paton, Boris Evgenievish; Dudko, Daniil Andreevich; Gvozdetsky, Vasily Stepanovich; Asoyants, Grigory Bagradovich; Sklyarevsky, Vladik Efimovich; Skrypnik, Valentin Ivanovich; and Shmakov, Eduard Ivanovich, 3,944,780.

Asplundh Tree Expert Co.: *See—*
Pletcher, Robert E., 3,944,147.

Asselman, George Albert Apolonia; Dirne, Adrianus Petrus; and Vromans, Petrus Helena Gerardus Maria, to U.S. Philips Corporation. Heating device. 3,943,964, Cl. 137-334.000.

Association Foret Cellulose (A.F.O.C.E.L.): *See—*
Leonard, Jean; and Touzet, Georges, 3,943,863.

Astrom, Ingmar; and Janson, Stig, to Gotaverken Angteknik AB. Device for operating air governing means at a refuse burning furnace. 3,943,861, Cl. 110-182.500.

Ate de Jonge, Frederik: *See—*
Dorleijn, Jan Willem Frederik; Druyvesteyn, Willem Frederik; and Ate de Jonge, Frederik, 3,944,842.

Ateliers et Chantiers de Bretagne - A.C.B. - S.A.: *See—*
Lecordier, Michel G., 3,943,982.

Atlantic Richfield Company: *See—*
Perkins, Thomas K., 3,943,618.

Atler, Lawrence A.: *See—*
Scheinberg, Samuel, 3,943,923.

Atsumo, Hideo: *See—*
Akiyama, Takao; Takani, Satoru; and Atsumo, Hideo, 3,943,751.

Aubert, Gilles; Lemoine, Roger; Maury, Andre; Moulin, Maurice; and Tomachevsky, Erik, to Commissariat a l'Energie Atomique. Wall inspection device. 3,943,756, Cl. 73-67.80S.

Audette, Richard T.; and Perry, Frederick G., to Texas Instruments Incorporated. Nonresettable thermally actuated switch. 3,944,960, Cl. 337-408.000.

Auerbach, Joab. Explosion proof venting device for electrical storage batteries. 3,944,437, Cl. 136-179.000.

Augenblick, Harry A.; and Keller, Richard, to Microlab/FXR. Harmonic communication system. 3,944,928, Cl. 325-65.000.

Aunspaugh, Aaron F. Fishing leader. 3,943,652, Cl. 43-42.740.

Aurora S.p.A.: *See—*
Verona, Franco, 3,944,372.

Auto-Safe Research and Development Corp.: *See—*
La Chiusa, Arturo A., 3,944,012.

Automatisme & Technique: *See—*
Lacombe-Allard, Jean-Francois, 3,943,702.

Automobiles Peugeot: *See—*
de Rosa, Daniel; and Lacambre, Jacques, 3,944,276.

Autonnic Limited: *See—*
Ganderton, Peter Clifton, 3,943,779.

Aya, Norimoto: *See—*
Takahashi, Kunihiro; Aya, Norimoto; Osaka, Kenji; and Furuta, Mithuru, 3,944,278.

Azalbert, Jean-Paul; Giraud, Adrien; Tassin, Claude J.; and Pech, Christian H., to Campagnie Francaise des Petroles, Societe Anonyme. Reservoir for storing hydrocarbon liquids and process for fabricating the same. 3,943,721, Cl. 61-.500.

B. F. Goodrich Company, The: *See—*
Fisher, John M., 3,944,023.
Kuts, Mathew, 3,943,806.
Slocombe, Robert J., 3,944,535.

Backes, William P. Battery post and cable clamp. 3,944,318, Cl. 339-231.000.

Bader, Andre; and Weiss, Francis. Enolic ethers of adipic dialdehyde and method for preparing the same. 3,944,591, Cl. 260-465.00F.

Badger Company, Inc., The: *See—*
Sheely, Harold R., 3,944,592.

Badger, Joe G., to Sarkes Tarzian, Inc. Fine tuning system having a limited user adjustable tuning range. 3,944,952, Cl. 334-39.000.

Badham, Rose A. Dispenser for threaded material. 3,944,165, Cl. 242-136.000.

Baer, John. Rain gauge. 3,943,762, Cl. 73-171.000.

Baghurst, Dennis John: *See—*
Franks, Joseph; and Baghurst, Dennis John, 3,944,873.

Baglai, Vitaly Mikhailovich: *See—*
Shtanko, Jury Pavlovich; Baglai, Vitaly Mikhailovich; Medovar, Boris Izrailevich; Stupak, Leonid Mikhailovich; Pavliichuk, Georgy Anatolievich; and Bogachenko, Alexei Georgievich, 3,944,714.

Baignol & Farjon S.A.: *See—*
Farjon, Raymond; Farce, Jacques; Doyelle, Francis; and Colin, Claude, 3,944,373.

Bains, Sudarshan S., to Xerox Corporation. Limitless sorter. 3,944,207, Cl. 270-58.000.

Baker Perkins Holdings Limited: *See—*
Edwards, Albert, 3,943,991.

Bakerdrill, Inc.: *See—*
Curington, Alfred R., 3,944,003.

Bakoledis, Andrew G., to Olin Corporation. Automatic fastener feed magazine and feed belt. 3,944,067, Cl. 206-347.000.

Baldwin, Bernard A., to Phillips Petroleum Company. Lubricants. 3,944,491, Cl. 252-45.000.

Balinski, Henry A., to United States Gypsum Company. Stud having kerf-engaging flange and fire-retardant wall structure formed therewith. 3,943,680, Cl. 52-481.000.

Balint, Andrew: *See—*
Goulds, Anthony John; and Balint, Andrew, 3,944,076.

Ballard, Frederick William: *See—*
Wallace, John Bernard; and Ballard, Frederick William, 3,944,107.

Banko, Edward J. Damper arrangement for controlling air or fluid flow. 3,943,995, Cl. 165-101.000.

Banzoli, Valeriano; De Nora, Giovanni; Di Tella, Vincenzo; Lalli, Domenico; and Tempo, Gianfranco, to Tecnomare S.p.A. Underwater stationary tank for storing large amounts of crude oil. 3,943,724, Cl. 61-46.500.

Barkdoll, Archie E.; and England, David C., to Du Pont de Nemours, E. I., and Company. Contact lens having a hard center and soft, tough periphery. 3,944,347, Cl. 351-160.000.

Barnes-Hind Pharmaceuticals, Inc.: *See*—
Hramchenko, Jack; and Sibley, Murray J., 3,944,506.

Bartenstein, Michael F., to Vermont Marble Company. Tool pack for forming metallic containers. 3,943,740, Cl. 72-45.000.

Barth, Hans-Jochen; Reinecke, Herbert; Hollenbach, Georg; and Kurz, Eduard, to Wacker Chemie GmbH. Thermoplastic mixtures suitable for foaming in the extrusion or injection molding process. 3,944,508, Cl. 260-2.50R.

Barth, Hubert, to Deere & Company. Tractor front-end weight assembly. 3,944,252, Cl. 280-150.00E.

BASF Aktiengesellschaft: *See*—
Cooper, Eugene A., 3,944,853.
Distler, Dieter; Wendel, Kurt; Einwiller, Andreas; and Oppenlaender, Knut, 3,944,690.

BASF Wyandotte Corporation: *See*—
Argade, Shyam D., 3,944,477.

Bashaw, John D.; Zaffaroni, Alejandro; and Michaels, Alan S., to ALZA Corporation. Self-monitored device for releasing agent at functional rate. 3,944,064, Cl. 206-.500.

Bateman, Charles D.; and Muller, Hans Rudolf, to Sundstrand Data Control, Inc. Aircraft ground proximity warning system having speed versus altitude compensation. 3,944,968, Cl. 340-27.0AT.

Bauer, Adolf; Weber, Karl Heinz; Minck, Klaus; and Danneberg, Peter, to Boehringer Ingelheim GmbH. 2-Amino-5-phenyl-4H-3,5-dihydro-1,5-benzodiazepin-4-ones and salts thereof. 3,944,579, Cl. 260-239.30B.

Bauer, Manfred; Kroesche, Herbert; Sauter, Roland; and Stechmann, Helmut, to Kienzle Uhrenfabriken GmbH. Quartz crystal controlled timekeeping apparatus. 3,943,695, Cl. 58-23.00D.

Bauer, Veral V.: *See*—
Kirkwood, Creal E.; and Bauer, Veral V., 3,943,878.

Baxendale, Lily: *See*—
Gottfried, Siegfried; and Baxendale, Lily, 3,944,660.

Baxter, Robert, Jr., to General Science Corporation. Platelet count correction circuit. 3,944,791, Cl. 235-92.0PC.

Bayer Aktiengesellschaft: *See*—
Beck, Manfred; Fritz, Rainer; and Theisen, Dieter, 3,944,533.

Beach Manufacturing, Inc.: *See*—
Czinger, David B., 3,943,852.

Beatty, Ronald L., to United States of America, Energy Research and Development. Process for preparing metal-carbide-containing microspheres from metal-loaded resin beads. 3,944,638, Cl. 264-.500.

Beaumont, Alan: *See*—
Stone, Wayne B., Jr.; and Beaumont, Alan, 3,943,879.

Bechtel, Klaus, to Visomat-Gerate GmbH. Photoelectric guard. 3,944,818, Cl. 250-221.000.

Beck, Christian A., to Pitney-Bowes, Inc. Sheet feeding apparatus. 3,944,215, Cl. 271-22.000.

Beck, Frank Valentine; Peterson, David Cartwright; Prell, Edward Myron; and Quin, Terrence Thomas, to Bell Telephone Laboratories, Incorporated. Memory diagnostic arrangement. 3,944,800, Cl. 235-153.0AM.

Beck, Manfred; Fritz, Rainer; and Theisen, Dieter, to Bayer Aktiengesellschaft. Polyalkenamers of wide molecular-weight distribution. 3,944,533, Cl. 260-93.100.

Becker, Joseph J.; Hochstrasser, Ulrich P.; and Skorianetz, Werner, to Firmenich S.A. Process for the preparation of oxophorones. 3,944,620, Cl. 260-586.00P.

Becker, Klaus, to ERNO Raumfahrttechnik GmbH. Attitude control for space vehicle. 3,944,172, Cl. 244-169.000.

Beckmann, Oskar; Habock, Adolf; and Leowald, Karl-Friedrich, to Siemens Aktiengesellschaft. Firing apparatus for a plurality of electric valves. 3,944,815, Cl. 250-209.000.

Becquet, Jean E., to Poclain. Pumps for motor fluid mechanisms. 3,943,827, Cl. 91-488.000.

Bede, James R., to Bede, James R. Hang glider. 3,944,169, Cl. 244-16.000.

Beesley, Casper R. Apparatus for color analysis of precious stones. 3,944,368, Cl. 356-30.000.

Beierwaltes, Richard R. Swimming pool touch pad. 3,944,763, Cl. 200-52.00R.

Bell, Duncan; Swanson, Donald A.; and Veale, John P., to Western Gear Corporation. Constant tension load-transferring apparatus and method. 3,944,120, Cl. 226-4.000.

Bell, Frank Rutherford. Method of forming an abrasive compact of cubic boron nitride. 3,944,398, Cl. 51-307.000.

Bell and Howell: *See*—
Fallos, George; and Morrison, Wilbur J., 3,944,213.

Bell and Howell Company: *See*—
Boyer, Harold E., 3,943,783.
Fallos, George, 3,944,209.
Fallos, George; and Kissawetter, James E., 3,944,214.
Ferrari, Leonard A., 3,944,728.
Fleischman, Andor A., 3,944,338.
Karsh, Irving, 3,945,036.

Bell, Reuben H.: *See*—
Foley, Kevin M.; McCombs, Frank Paul; and Bell, Reuben H., 3,944,515.

Bell Telephone Laboratories, Incorporated: *See*—
Beck, Frank Valentine; Peterson, David Cartwright; Prell, Edward Myron; and Quin, Terrence Thomas, 3,944,800.
Burns, Thomas Victor; and Shea, Donald Ray, 3,944,746.
Cuthbert, John David; Fehrs, Delmer Lee; and Munro, David Farnham, 3,944,369.
Duttweiler, Donald Lars; and Messerschmitt, David Gavin, 3,945,002.
Gannett, Danforth K., 3,944,744.
Gannett, Danforth K., 3,944,745.
Hacker, Joseph Michael; Kaufman, Stanley; Sabia, Raffaele Antonio; Sauer, Earl Salvator; Tidd, Charles Edward, Jr.; and Walker, Raymond, 3,944,717.
Kahng, Dawon; and Ligenza, Joseph Raymond, 3,945,031.
Kurth, Carl Ferdinand, 3,944,951.
Walden, Robert Henry, 3,944,850.

Bellina, Russell F., to Du Pont de Nemours, E. I., and Company. Pesticidal dithiazolium salts. 3,944,670, Cl. 424-250.000.

Beltek Corporation: *See*—
Miyachi, Tatsuro, 3,944,924.

Bendix Corporation, The: *See*—
McKeown, James E.; and Michel, Donald E., 3,944,313.

Bent, John H., to Minnesota Mining and Manufacturing Company. Quick release mechanism for surgical devices. 3,943,934, Cl. 128-317.000.

Benton, Stephen A., to Polaroid Corporation. Light filtering arrangement for holographic displays. 3,944,322, Cl. 350-3.500.

Benwood, Bruce R.; and Siebenrock, Howard D., to Eastman Kodak Company. Voltage measurement apparatus. 3,944,354, Cl. 355-3.00R.

Bergen, Richard F., to Xerox Corporation. Color image reproduction system. 3,944,358, Cl. 355-9.000.

Bergeron, Maurice, to Compagnie Europeenne de Manutention. Soiled-dishes handling apparatus. 3,944,093, Cl. 214-310.000.

Bergquist, Daryl J.: *See*—
Chuan, Raymond L.; Mahadevan, Parameswar; and Bergquist, Daryl J., 3,944,834.

Berkestad, Karl-Erik; and Borjesson, Lars Goran Torgny. Resistance device for a gymnastics apparatus. 3,944,221, Cl. 272-79.00C.

Berkovich, Anatoly Jurievich: *See*—
Polyanin, Valery Andreevich; Berkovich, Anatoly Jurievich; Zabegalov, Georgy Vasilievich; and Soin, Jury Konstantinovich, 3,944,089.

Berry, Clyde F. Steam generation system. 3,943,718, Cl. 60-676.000.

Bertolasi, Robert B., to Kelsey-Hayes Company. Skid control system for two-wheeled vehicles. 3,944,288, Cl. 303-21.0AF.

Bhaskar, Surindar N.; Selting, Wayne J.; Gilmore, Eleanor L.; and Gross, Arthur, to United States of America, Army. Tongue cleaning device. 3,943,592, Cl. 15-160.000.

Bianchetta, Donald L.; Lohbauer, Kenneth R.; and Rhodes, Sammy J., to Caterpillar Tractor Co. Hydraulic control system for load supporting hydraulic motors. 3,943,825, Cl. 91-438.000.

Biermann, Willi; Iversen, Klaus; and Lohe, Johannes, to Interatom, International Atomreaktorbau GmbH. Spacer for fuel rods in nuclear fuel elements. 3,944,467, Cl. 176-78.000.

Bigatel, Alfred I.; Jarrett, Quentin T.; Petskus, Ronald A.; Rowan, David C.; and Scheetz, Joseph M., to Western Electric Co., Inc. Proximity printing. 3,944,419, Cl. 96-27.00R.

Bil, Milos S., to Clairol Incorporated. 4-Fluoro-3-nitro anilines. 3,944,612, Cl. 260-573.000.

Billings, Thomas A. Harvesting machine. 3,943,688, Cl. 56-328.00R.

Bills, Jay P.; and France, Edward LeRoy. Dehydrator. 3,943,842, Cl. 99-473.000.

Bingham, George H.; and Krupotich, Edward A., to Omation Corporation. Automated envelope opener. 3,943,807, Cl. 83-79.000.

Bingle, Gerald L., to Federal-Mogul Corporation. Plastic bearing cage. 3,944,307, Cl. 308-217.000.

Biorex Laboratories, Limited: *See*—
Gottfried, Siegfried; and Baxendale, Lily, 3,944,660.

Bird, Graham, to Petrocarbon Developments Limited. Method and apparatus for separating gases. 3,944,400, Cl. 55-21.000.

Bishop, Arthur E. Rack and pinion steering gear. 3,944,015, Cl. 180-79.20R.

Bitonti, Paul A.; and Lytle, John P., to Ross Operating Valve Company. System for conserving compressed air supply. 3,943,972, Cl. 137-624.110.

Bittle, James Long; and Rubic, Wayne J., to Pitman-Moore, Inc. Feline calicivirus vaccine and production thereof. 3,944,469, Cl. 195-1.300.

Bizien, Jean-Pierre; Patouilliart, Rene G.; and George, Michel, to Etat Francais. Artillery projectile with spreading tail assembly. 3,944,168, Cl. 244-3.280.

Bizouard, Alain; and Rannou, Jean, to Thomson-CSF. Wide-band spiral antenna. 3,945,016, Cl. 343-895.000.

Blackstock, Billy J.; and Adkisson, Truman D. Hunter's seat. 3,944,279, Cl. 297-217.000.

Blakemore, Bernard: *See*—
Sword, Geoffrey; Lawrence, John Leslie; Raggett, Stephen Richard; and Blakemore, Bernard, 3,944,739.

Blankenship, Ernest Bayne, to Research Products/Incinolet Corporation. Incinerator toilet. 3,943,579, Cl. 4-131.000.

Blinn, Franz J. Collecting device for producing long wire rod coils. 3,944,158, Cl. 242-81.000.

Bloom, Stanley M.; Idelson, Elbert M.; Simon, Myron S.; and Waller, David P., to Polaroid Corporation. Aminomethyl-substituted 1-naphthol phthalides and naphthalides. 3,944,569, Cl. 260-343.30R.

Boatman, Marvin C. Protective helmet. 3,943,571, Cl. 2-2.10R.

Bober, Lee M., to Park-Ohio Industries, Inc. Method of inductively heating and quench hardening camshafts. 3,944,446, Cl. 148-131.000.

Bodanszky, Miklos. Process and apparatus for the synthesis of peptides not linked to polymers. 3,944,538, Cl. 260-112.50R.

Bodendorfer, Roland. Ski binding. 3,944,240, Cl. 280-11.35T.

Boehringer Ingelheim GmbH: *See*—
Bauer, Adolf; Weber, Karl Heinz; Minck, Klaus; and Danneberg, Peter, 3,944,579.

Boehringer Mannheim GmbH: *See*—
Winter, Werner; Thiel, Max; Stach, Kurt; Roesch, Egon; and Sponer, Gisbert, 3,944,566.

Boeing Company, The: *See*—
Boone, Jimmie H.; and Simpson, Robert D., 3,944,171.

Bogachenko, Alexei Georgievich: *See*—
Shtanko, Jury Pavlovich; Baglai, Vitaly Mikhailovich; Medovar, Boris Izrailevich; Stupak, Leonid Mikhailovich; Pavliichuk, Georgy Anatolievich; and Bogachenko, Alexei Georgievich, 3,944,714.

Bogaert, Pierre Joseph, to Manta. Rotary hook for sewing machine. 3,943,866, Cl. 112-228.000.

Bogenschutz, Thomas M.: *See*—
Engle, Thomas H.; and Bogenschutz, Thomas M., 3,944,286.

Bogue, John C.: *See*—
Willcocks, Martin Edmund George, 3,944,735.

Bohm, Wolfgang: *See*—
Wolf, Helmut; Bohm, Wolfgang; and Stucker, Erwin, 3,943,758.

Bohnert, Eckhard Reiner: *See*—
Fritsch, Rudolf Paul; and Bohnert, Eckhard Reiner, 3,943,640.

Bolding, Vance E.: *See*—
Person, Abraham; and Bolding, Vance E., 3,943,868.

Bolker, James H., to Kendall Company, The. Conformable surgical hood. 3,943,575, Cl. 2-205.000.

Bolte, Brown. Pocket bun baking device. 3,943,840, Cl. 99-428.000.

Bom, Cornelis Johannes Gerardus: *See*—
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 3,943,999.
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 3,944,000.

Bond, Herbert M.; and Torgersen, Daniel L., to Buckbee-Mears Company. Increasing the yield of cast plastic lenses. 3,944,637, Cl. 264-1.000.

Bonsack, James Paul, to SCM Corporation. Recovering chlorine from the chlorination of titaniferous material. 3,944,647, Cl. 423-72.000.

Boone, Jimmie H.; and Simpson, Robert D., to Boeing Company, The. Glide slope control signal processing system. 3,944,171, Cl. 244-77.00A.

Boone, Philip. Shelf attachment. 3,943,859, Cl. 108-50.000.

Boone, Ralph D. Irrigation system (lifting dogs). 3,943,966, Cl. 137-344.000.

Borer, Alan John, to Taylor Servomex Limited. Current measurement. 3,944,920, Cl. 324-111.000.

Borg, Arthur N.; and Smith, Bruce E., to Magnavox Company, The. Multi-level television receiver channel indicia display. 3,945,003, Cl. 340-377.000.

Borg-Warner Corporation: *See*—
Maudlin, Wendell E., 3,943,728.

Borg-Warner Limited: *See*—
Hills, Richard, 3,943,956.

Borjesson, Lars Goran Torgny: *See*—
Berkestad, Karl-Erik; and Borjesson, Lars Goran Torgny, 3,944,221.

Boslough, James, to Raymond Lee Organization, Inc., The, a part interest. Clampable bicycle stand. 3,944,079, Cl. 211-5.000.

Boteler, Winston C.: *See*—
Short, Joe T.; Knight, Lee H., Jr.; Frentress, Zane; and Boteler, Winston C., 3,943,865.

Bower, Kenneth W., to Uarco Incorporated. Deleaver for continuous business forms. 3,944,206, Cl. 270-52.500.

Bowers, Lewis H.; Jankowski, Raymond E.; and Sullivan, John L., to Schenectady Chemicals, Inc. ABS-formaldehyde novolak. 3,944,510, Cl. 260-19.0UA.

Boyd, Dennis; and Porter, George, to Gallaher Limited. Synthetic smoking product. 3,943,941, Cl. 131-2.000.

Boyden, Robert E., to O'Reilly, Thomas B. Single element flexible type drum. 3,944,052, Cl. 197-53.000.

Boyer, Harold E., to Bell and Howell Company. Storable rack assembly. 3,943,783, Cl. 74-89.210.

BP Chemicals International Limited: *See*—
Dobson, Kenneth Rowland, 3,944,597.

Bradley, Earl H., to General Signal Corporation. Stabilization of waste material. 3,943,955, Cl. 137-14.000.

Bradley, Geoffrey; Hargreaves, Keith; and Wainwright, Paul, to Rocol Limited. Anaerobic adhesives consisting of polyalkoxy diacrylate ester of bisphenol a monomer and dimethylaminoethyl methacrylate monomer using hydroperoxide as catalyst. 3,944,521, Cl. 260-47.0UA.

Bradley, Michael F.: *See*—
Budington, Richard V.; and Bradley, Michael F., 3,944,072.

Brandenstein, Manfred: *See*—
Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, 3,944,011.

Brandstaetter, David Peter; and Harris, James Marian, to Texas Instruments Incorporated. Workspace addressing system. 3,944,985, Cl. 340-172.500.

Branham, Norvel R., to Branham, Norvel R. Display board construction. 3,943,646, Cl. 40-64.00R.

Branick, Charles Earl. Tire stitching apparatus. 3,944,458, Cl. 156-412.000.

Braun, Anton. Machine bearing construction and arrangement. 3,944,299, Cl. 308-3.0CH.

Braun, Ernst; and Braun, Gert, to Halbach and Braun. Trough conveyor construction, particularly for scraper chain conveyors. 3,944,061, Cl. 198-204.000.

Braun, Gert: *See*—
Braun, Ernst; and Braun, Gert, 3,944,061.

Brekelbaum, Erwin C. Oxidation cutting work support means. 3,944,203, Cl. 269-296.000.

Breland, John G.: *See*—
Villaescusa, Frank W.; Breland, John G.; and Arnold, Fred E., 3,944,575.

Brenan, Robert R.; and Johnson, Gordon L., to GTE Sylvania Incorporated. Method for making tined electrical contacts. 3,943,625, Cl. 29-630.00C.

Brennan, Francis P. Pallet skid device. 3,943,860, Cl. 108-55.000.

Breuer, Hermann; and Treuner, Uwe, to E. R. Squibb & Sons, Inc. Cyanomethylthioacetylcephalosporins. 3,944,546, Cl. 260-243.00C.

Bridgeport Metal Goods Manufacturing Company, The: *See*—
Moore, Arthur H., 3,944,805.

Bright, William L. Enclosure for pad mounted equipment. 3,944,718, Cl. 174-50.000.

Brinkman, Willem, to Holec N.V. Injector. 3,943,892, Cl. 123-32.0EA.

Brinkmann, Jurgen; Rasche, Manfred; and Heissmann, Willi, to Varta Batterie Aktiengesellschaft. Storage battery plate and manufacturing process therefor. 3,944,432, Cl. 136-63.000.

British Columbia Research Council: *See*—
Sanders, Raymond J., 3,943,875.

British Nuclear Fuels Ltd.: *See*—
Hayes, Michael Richard, 3,944,053.

Brockmuller, Friedrich Franz, to Windmoller & Holscher. Production of lined valved bags. 3,943,833, Cl. 93-35.00R.

Brockway, M. Clifford; and Sharpe, Robert E., to Liberty Glass Company. Containment coating composition. 3,944,100, Cl. 215-1.00C.

Brodsky, Mikhail Shikovich: *See*—
Bykhovsky, David Grigorievich; Danilov, Aldexandr Ivanovich; and Brodsky, Mikhail Shikovich, 3,944,778.

Broecker, Bernhard; Schardt, Richard; and Werner, Gerhard, to Hoechst Aktiengesellschaft. Process for the manufacture of heat-curable synthetic resins which can be diluted with water and are suitable for the electrophoretic coating process. 3,944,512, Cl. 260-23.70R.

Broide, Pinkhus Ruvimovich; Surkov, Igor Konstantinovich; and Grachev, Andrei Nikolaevich. Profile-grinding machine. 3,943,664, Cl. 51-5.00D.

Bromwell, John J., to Raymond Lee Organization, Inc., The. Hockey game apparatus. 3,944,223, Cl. 273-1.00B.

Brouant, Michel, to Compagnie Industrielle Des Telecommunications Cit-Alcatel. Phase correlator. 3,944,938, Cl. 329-50.000.

Brown, Boveri & Cie Aktiengesellschaft: *See*—
Hegewaldt, Fritz; Gillhaus, Horst; and Erdman, Otto, 3,944,715.

Brown, Herbert: *See*—
Smith, Melvin F., Jr.; and Sher, Jay, 3,944,021.

Brown, Robert Lawrence. Round bale trailer with loading winch and bridle. 3,944,095, Cl. 214-506.000.

Brown, Ronald Leroy. Speaker headrest for motor vehicles. 3,944,020, Cl. 181-141.000.

Brown & Williamson Tobacco Corporation: *See*—
Luke, John A.; and Harrison, Raymond J., 3,943,835.
Sexstone, John H., 3,943,832.

Brownell, Peter Gray. Ratio computer. 3,944,799, Cl. 235-152.000.

Bruke, Richard Leroy; and Larsson, Lars Goran, to Aktiebolaget Platmanufaktur. Dispensing carton having a bag-like liner. 3,944,127, Cl. 229-14.00B.

Brunetti, Heimo: *See*—
Schwarzenbach, Kurt; and Brunetti, Heimo, 3,944,632.

Brunner, Anton; and Willburger, Nikolaus, to Siemens Aktiengesellschaft. Double omni-directional antenna. 3,945,013, Cl. 343-708.000.

Brunswick Corporation: *See*—
Meyer, James A., 3,943,790.

Buchler Instruments, Div. of Searle Analytic, Inc.: *See*—
Gelfand, Daniel, 3,943,983.
Parker, Bernard; Gross, Otto; and Buchler, Joseph, 3,944,188.

Buchler, Joseph: *See*—
Parker, Bernard; Gross, Otto; and Buchler, Joseph, 3,944,188.

Buckbee-Mears Company: *See*—
Bond, Herbert M.; and Torgersen, Daniel L., 3,944,637.

Bucyrus-Erie Company: *See*—
Learmont, Tom; Nelmark, Jack D.; Martin, Gary E.; and Raske, Theodore F., 3,944,300.

Budington, Richard V.; and Bradley, Michael F., to Longview Fibre Company. Octagonal dispenser carton for band saw coils. 3,944,072, Cl. 206-395.000.

Budmiger, Hermann, to UTP Arbeitsschutz AG. Automatic protective shade equipment on protective visors, protective helmets or protective goggles, particularly for fusion welding. 3,943,573, Cl. 2-8.000.

Buell, Eugene F. Apparatus for feeding granular material to a steel bath. 3,944,195, Cl. 266-34.00A.

Bujdoso, Erno: *See*—
Solymar, Karoly; Zambo, Janos; Orban nee Kelemen, Marika; Bujdoso, Erno; Feher, Ivan; Ozvald, Zoltan; Voros, Istvan; Ferenczi,

Tibor; Toth, Pal; Lazar, Ferenc; Pinter, Tihamer; Sigmond, Gyorgy; Siklosi, Peter; Wentzely, Kalman; Lengyel, Laszlo; and Matyasi, Jozsef, 3,944,648.
Bulten-Kanthal AB Hallstahammar: *See—*
Lejdegard, Sixten Harald, 3,943,986.
Burgheimer, Joanne, to Dimension Weld International Corporation, The. Heat-bonding method. 3,944,454, Cl. 156-273.000.
Burkhalter, John E.: *See—*
Cutchins, Malcolm A.; Foster, Winfred A., Jr.; Orlin, Peter A.; Martin, Fred W.; and Burkhalter, John E., 3,944,137.
Burns, Thomas Victor; and Shea, Donald Ray, to Bell Telephone Laboratories Incorporated. Collecting switching system call data. 3,944,746, Cl. 179-7.10R.
Burroughs Corporation: *See—*
Przybylek, George J., 3,944,869.
Sprenkle, George J.; and Cicero, David A., 3,944,311.
Burrows, Harold George; and Hepworth, Stephen John, to Imperial Chemical Industries, Ltd. Polyamides having improved dyeability and thermal stability. 3,944,518, Cl. 260-45.75C.
Burt, Gerald D.; and Mudrak, Anton, to Harshaw Chemical Company, The. Precipitation of organic dyes and dye intermediates in the presence of finely divided polytetrafluoroethylene. 3,944,540, Cl. 260-186.000.
Busch, Albert E., to Sarkes Tarzian, Inc. Video special effects generator. 3,944,731, Cl. 178-6.800.
Buscher, Richard George; and Soderlund, Gunnar M., to Lear Siegler, Inc. Digital signal selector device. 3,944,974, Cl. 340-146.1BE.
Butler, Donald E., to SSP Agricultural Equipment, Inc. Moisturizing apparatus for use with wind machines. 3,944,139, Cl. 239-77.000.
Butler, Larry D.: *See—*
Standbridge, Wilbur R.; Butler, Larry D.; and Sivy, William H., 3,943,844.
Butt, Sheldon H.: *See—*
Ford, James A.; and Butt, Sheldon H., 3,944,504.
Butter, Stephen A.: *See—*
Whitehurst, Darrell D.; Butter, Stephen A.; and Rodewald, Paul G., 3,944,501.
Byk Gulden Lomberg Chemische Fabrik GmbH: *See—*
Klemm, Kurt; and Langenscheid, Erhard, 3,944,667.
Bykhovsky, David Grigorievich; Danilov, Aldexandr Ivanovich; and Brodsky, Mikhail Shikovich. Electrode assembly of plasmatron. 3,944,778, Cl. 219-121.00P.
Byrne, James C., to General Motors Corporation. Single injector throttle body. 3,943,904, Cl. 123-139.0AW.
C. A. V. Limited: *See—*
Skinner, Robert Thomas John, 3,943,902.
Skinner, Robert Thomas John, 3,943,903.
C.F.K. Engineering Company: *See—*
Foote, Alfred F., 3,944,098.
C.G.R. Generay S.p.A.: *See—*
Cesar, Jean, 3,944,204.
C.G.R. -MeV: *See—*
Piret, Pierre; Fraikin, Hubert; and Hubert, Armand, 3,944,836.
Caldwell, Hamlin A., Jr.: *See—*
Loeser, Harrison T.; and Caldwell, Hamlin A., Jr., 3,944,964.
Calgon Corporation: *See—*
Guilbault, Lawrence James; and Hoffstadt, Frederick Alan, 3,943,996.
Calia, Hank A., to Raymond Lee Organization, Inc., The, a part interest. Horse trailer waste unit. 3,943,890, Cl. 119-95.000.
California Institute of Technology: *See—*
Rembaum, Alan; Yen, Shiao-Ping S.; and Klein, Elias, 3,944,485.
Cameron, Robert C. Disposable earlobe piercing apparatus. 3,943,935, Cl. 128-330.000.
Campagnie Francaise des Petroles, Societe Anonyme: *See—*
Azalbert, Jean-Paul; Giraud, Adrien; Tassin, Claude J.; and Pech, Christian H., 3,943,721.
Campbell, Barbara Cox: *See—*
Campbell, James W., 3,943,612.
Campbell, James W., to Campbell, Barbara Cox. Drive apparatus for tenter frames. 3,943,612, Cl. 26-57.00E.
Campbell Soup Company: *See—*
Cramer, Clarence W., 3,943,600.
Egee, Walter Warren, 3,944,119.
Feehery, William J., Jr., 3,944,056.
Weaver, George R., 3,944,051.
Canada Packers Limited: *See—*
D'Souza, Godfrey B., 3,944,651.
Canadian Patents & Development Ltd.: *See—*
Sayer, Michael, 3,944,866.
Canevari, Roger: *See—*
Regnier, Gilbert; Canevari, Roger; Laubie, Michel; and Poignantw, Jean-Claude, 3,944,551.
Cannon, John G., to Westinghouse Air Brake Company. Truck bolster center bowl wear plate. 3,944,298, Cl. 308-137.000.
Canon Kabushiki Kaisha: *See—*
Hasegawa, Goro; Nakamoto, Soichi; Watanabe, Yoshiaki; Taguchi, Tetsuya; and Yamada, Katuhiko, 3,945,024.
Hashimoto, Shigeru, 3,944,340.
Ito, Yuji; and Kato, Nori, 3,944,351.
Momiyama, Kikuo, 3,944,339.
Suzuki, Michiko, 3,945,034.
Tajima, Akira; Hirose, Ryusho; Hosoe, Kazuya; Furukawa, Hiroshi; and Ichiyanagi, Toshikazu, 3,944,324.
Tsuda, Shin; and Hiraga, Ryozo, 3,944,921.
Cantarutti, Armindo, to NRM Corporation. Tire building machine. 3,944,456, Cl. 156-398.000.
Cantwell, Robert R.; and Marquart, Tom E., to Kellwood Company. Umbrella tent. 3,943,953, Cl. 135-3.00E.
Cantwell, Robert Roger: *See—*
Marquart, Tom Eugene; and Cantwell, Robert Roger, 3,943,952.
Caporiccio, Gerardo; and Carniselli, Giuliano, to Montedison S.p.A. N,N-bis-aminoalkylamides of polyoxaperfluoroalkandioic acids, derivatives thereof and process for preparing same. 3,944,610, Cl. 260-561.0HL.
Caporin, Edward A.; Abruzzo, Joseph; and Rees, Frank L., to United States of America, Navy. Overflow threshold control for sonar. 3,944,965, Cl. 340-3.00R.
Caprile, Marilyn E.: *See—*
Caprile, Robert C.; and Caprile, Marilyn E., 3,944,132.
Caprile, Robert C.; and Caprile, Marilyn E. Multi-pocketed envelope. 3,944,132, Cl. 229-72.000.
Carba Limited: *See—*
Siegenthaler, Peter, 3,944,635.
Cardenas, Ricardo L.: *See—*
Flournoy, Kenoth H.; Cardenas, Ricardo L.; and Carlin, Joseph T., 3,943,954.
Carder, Victor H., to Cochran-Boothe Airport Systems. Freight transporter and loader for aircraft. 3,944,096, Cl. 214-512.000.
Cardwell, Charles G.; and Speck, Morris E., to Phillips Petroleum Company. Pallet and an integral package utilizing the pallet. 3,944,070, Cl. 206-386.000.
Carin, Jesus R. Oscillatory peripheral agitation washing machine. 3,943,736, Cl. 68-133.000.
Carl Hurth Maschinen und Zahnradfabrik: *See—*
Loos, Herbert, 3,943,822.
Riedmayr, Georg, 3,944,980.
Carlin, Joseph T.: *See—*
Flournoy, Kenoth H.; Cardenas, Ricardo L.; and Carlin, Joseph T., 3,943,954.
Carlisle Corporation: *See—*
Percifield, Edward K., 3,943,785.
Carney, William V.; and DeLuca, Paul V., to Porta Systems Corporation. Talk line multiple communication and test apparatus. 3,944,758, Cl. 179-175.000.
Carniselli, Giuliano: *See—*
Caporiccio, Gerardo; and Carniselli, Giuliano, 3,944,610.
Carothers, Paul A., to Carothers, Paul A.; Jones, Rodney V.; and McCoy, Ernest H., part interest to each. Roofing panel system. 3,943,677, Cl. 52-309.000.
Carr, W. John, Jr., to Electron Optics Corporation. Uni-directional viewing system. 3,944,336, Cl. 350-174.000.
Carter, Don W. Therapeutic pool system. 3,943,580, Cl. 4-172.150.
Carter, Frank H. Multi-windmill wheel power generator. 3,944,839, Cl. 290-55.000.
Carter, Fred L.: *See—*
Comisar, Gerald G.; and Carter, Fred L., 3,944,788.
Cartwright, William F.; Means, Richard E.; and Kallianos, Andrew G., to Liggett & Myers Incorporated. Cinnamic derivatives as tobacco additives. 3,943,943, Cl. 131-17.00R.
Casagrande, Fulvio: *See—*
Schellenbaum, Max; Duennenberger, Max; and Casagrande, Fulvio, 3,944,652.
Casey, Robert, to Caterpillar Tractor Co. Single lever control for multi-valve operation. 3,943,791, Cl. 74-471.0XY.
Caterpillar Tractor Co.: *See—*
Bianchetta, Donald L.; Lohbauer, Kenneth R.; and Rhodes, Sammy J., 3,943,825.
Casey, Robert, 3,943,791.
Downing, Benjamin A., 3,944,073.
Lloyd, Michael K.; and Rosenberger, Paul C., 3,944,295.
Schexnayder, Lawrence F., 3,943,717.
Schwartzkopf, Glen E., 3,944,196.
Stedman, Robert N., 3,943,793.
Stedman, Robert N., 3,944,297.
Caton, Joe L.; and Caton, Larry, to Lawrence Peska Associates, Inc., a part interest. Shower head. 3,944,140, Cl. 239-315.000.
Caton, Larry: *See—*
Caton, Joe L.; and Caton, Larry, 3,944,140.
Caule, Elmer J., to Olin Corporation. Method of producing tarnish resistant copper and copper alloys and products thereof. 3,944,449, Cl. 156-316.000.
Caywood, John Millard: *See—*
Tasch, Al Felix, Jr.; and Caywood, John Millard, 3,944,849.
Celesco Industries Inc.: *See—*
Chuan, Raymond L.; Mahadevan, Parameswar; and Bergquist, Daryl J., 3,944,834.
Centralny Osrodek Projektowo-Technologiczny Przemyslu Maszyn Gorniczych "ORTEM": *See—*
Jachna, Waclaw, 3,944,484.
Centre for Industrial Research (CIR) Ltd: *See—*
Fridman, Eliahu; and Dolev, Amior, 3,944,676.
Centronics Data Computer Corporation: *See—*
Jozuka, Masao, 3,944,029.
Cerioni, Renzo Giuseppe, to El Cu S.p.A. Apparatus for taking-up and conveying bags. 3,943,687, Cl. 53-188.000.
Cerny, Arnost, to Adamovske strojirny. Sheet transfer cylinders. 3,944,218, Cl. 271-277.000.
Cesar, Jean, to C.G.R. Generay S.p.A. Radiological examination table. 3,944,204, Cl. 269-323.000.

Chabardes, Pierre; Grard, Charles; and Schneider, Charles, to Rhone-Poulenc S. A. Isomering oxidation of ethylenic alcohols to give ethylenic carbonyl compounds. 3,944,623, Cl. 260-603.0HF.

Chadwick-Helmuth Company, Inc.: *See—*
Helmuth, James G., 3,944,876.

Chagny, Jean; Francoise, Guy; and Thevenet, Daniel, to Entreprise de Recherches et d'Activites Petrolieres Elf. Method and device for sampling gases. 3,944,824, Cl. 250-288.000.

Chambers, Roger Nicolas Crovo; and Amis, Peter William, to Parc-Amber Company Limited, The. Resistivity measuring heads. 3,944,922, Cl. 324-158.00P.

Champan, Louis W.: *See—*
Proctor, Darryl F.; Skelly, Peter T.; and Champan, Louis W., 3,944,753.

Champenois, Michel: *See—*
Lacorre, Jean; and Champenois, Michel, 3,944,902.

Champion Spark Plug Company: *See—*
Green, Sam J.; and Raeske, Frank J., 3,943,896.

Chan, David Cheong King, to Chevron Research Company. Herbicidal N-(N'-alkynylcarbamylmethyl)-2,6-dialkyl-α-haloacetanilides. 3,944,607, Cl. 260-558.00A.

Chandler, Roy L., to Geno Corporation. Communication device for assisting the driver of a vehicle. 3,944,972, Cl. 340-74.000.

Chao, Albert, to Lawrence Peska Associates, Inc., a part interest. Lantern safety device. 3,944,803, Cl. 240-6.40W.

Chao, Sam T.; Cimarusti, Christopher M.; and Varma, Ravi K., to E. R. Squibb & Sons, Inc. Steroidal (16α,17-d)cyclohexenes. 3,944,584, Cl. 260-397.300.

Charron, Charles S. Tensile member with tension indicating means. 3,943,819, Cl. 85-62.000.

Chasen, Lee Richard: *See—*
Einhorn, Ruediger; Chasen, Lee Richard; and Hannes, Karl, 3,944,186.

Chavarria, S. T.: *See—*
Ramirez, Ciro, 3,944,971.

Chemetron Corporation: *See—*
Rogers, Gerald L., 3,944,180.

Chemische Werke Witten GmbH: *See—*
Katzschmann, Ewald, 3,944,602.

Cheremisinoff, Paul, to Engelhard Minerals and Chemicals Corporation. Air pollution control apparatus and process. 3,944,402, Cl. 55-92.000.

Cherney, Dale Mark: *See—*
Kovacs, Lloyd; and Cherney, Dale Mark, 3,943,683.

Cherubim, Martin; and Abodagga, Faisal, to Deutsche Texaco Aktiengeselischaft. Process for the production of alkyl-substituted unsaturated δ-lactams. 3,944,559, Cl. 260-297.00Z.

Chevron Research Company: *See—*
Chan, David Cheong King, 3,944,607.
De Baun, Bruce, 3,943,775.
Toland, William G.; and Woods, Quentin T., 3,944,452.

Chicago Pneumatic Tool Company: *See—*
Lesner, Richard S., 3,943,800.

Chikawa, Junichi, to Nippon Hoso Kyokai. X-Ray topograph reproducing apparatus. 3,944,823, Cl. 250-274.000.

Chisso Corporation: *See—*
Okamoto, Takehiko; Ohashi, Tamihiro; and Koga, Isao, 3,944,622.

Chivinsky, Joseph A., to Allegheny Ludlum Industries, Inc. Pressure bonded, low yield strength composite. 3,944,396, Cl. 29-196.300.

Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, to Hoffmann-La Roche Inc. Phenyl derivatives. 3,944,531, Cl. 260-600.00R.

Cholet, Jacques; Laurent, Jean; and Magneville, Pierre, to Institut Francais du Petrole. Shock absorber. 3,944,031, Cl. 188-317.000.

Chollet, Albert, to Etablissement Studia Technica. Flexible annular joint. 3,944,105, Cl. 220-4.00E.

Chou, Sunlin, to Intel Corporation. Semiconductor memory employing charge-coupled shift registers with multiplexed refresh amplifiers. 3,944,990, Cl. 340-173.0RC.

Chou, Ta-Sen, to Eli Lilly and Company. Process for preparing desacetoxycephalosporins. 3,944,545, Cl. 260-243.00C.

Chrepta, Metro M.: *See—*
Jacobs, Harold; and Chrepta, Metro M., 3,944,950.

Christensen, Carl O., to Roll-Rite Corporation. Double ended warehouse trailer. 3,944,258, Cl. 280-408.000.

Christensen, Wendell N.: *See—*
Davis, Delmar B.; and Christensen, Wendell N., 3,944,487.

Chrysler United Kingdom Limited: *See—*
Wisdom, Ronald David, 3,944,804.

Chu, Chang Kwei: *See—*
Krishna, Surinder; and Chu, Chang Kwei, 3,945,028.

Chuan, Raymond L.; Mahadevan, Parameswar; and Bergquist, Daryl J., to Celesco Industries Inc. Pollution monitor with self-contained calibration and cell-block therefor. 3,944,834, Cl. 250-372.000.

Chudgar, Anil H.; Fischer, Richard L.; and Holmgren, Marvin E., to Imperial-Eastman Corporation. Hose construction. 3,944,453, Cl. 156-143.000.

Chudleigh, Walter H., Jr., to Control Data Corporation. Automatic gain control circuit and method. 3,944,942, Cl. 330-86.000.

Chun, Kil Whan: *See—*
Alterman, David S.; and Chun, Kil Whan, 3,944,497.

Church, Peter K.; and Knutson, Oliver J., to Kaman Sciences Corporation. Methods of producing chemically hardening coatings. 3,944,683, Cl. 427-34.000.

Ciba-Geigy: *See—*
Schellenbaum, Max; Duennenberger, Max; and Casagrande, Fulvio, 3,944,652.

Ciba-Geigy AG: *See—*
Nikles, Erwin; Dittrich, Volker; and Pinter, Ladislaus, 3,944,674.

Ciba-Geigy Corporation: *See—*
Darmory, Franklin P.; and DiBenedetto, Marianne, 3,944,525.
Durrell, William S.; and Eckert, Robert J., Jr., 3,944,656.
Dziemian, Robert; and Finch, Neville, 3,944,671.
Hostettler, Hans; Abel, Heinz; and Topfl, Rosemarie, 3,944,385.
Iselin, Beat; and Sieber, Peter, 3,944,590.
Kleiner, Eduard K.; and Spivack, John D., 3,944,594.
Kray, Raymond J., 3,944,526.
Model, Ernst; von der Crone, Jost; and Pugin, Andre, 3,944,547.
Rohr, Otto, 3,944,411.
Rossi, Alberto, 3,944,589.
Schwarzenbach, Kurt; and Brunetti, Heimo, 3,944,632.

Cicero, David A.: *See—*
Sprenkle, George J.; and Cicero, David A., 3,944,311.

Cimarusti, Christopher M.: *See—*
Chao, Sam T.; Cimarusti, Christopher M.; and Varma, Ravi K., 3,944,584.

Cincinnati Milacron Inc.: *See—*
Luebkemann, Harry Paul E.; and Wood, David Bradford, III, 3,943,802.

Clairol Incorporated: *See—*
Bil, Milos S., 3,944,612.

Clark, Harold A., to Dow Corning Corporation. Fibrous structures bonded with a silsesquioxane-containing composition. 3,944,702, Cl. 428-288.000.

Clark, William R., to I-T-E Imperial Corporation. Selective tripping of two-pole ground fault interrupter. 3,944,888, Cl. 317-18.00D.

Clayton Dewandre Company Limited: *See—*
Coupland, Ralph, 3,943,831.

Cleaver, David Frederick, to Paterson Zochonis & Company, Limited. Antimicrobial compositions. 3,944,668, Cl. 424-227.000.

Cleeton, Claud E., to United States of America, Navy. Radio frequency coding system. 3,945,006, Cl. 343-6.00R.

Clegg, Roy, to Davy-Loewy Limited. Position transducer arrangement. 3,944,903, Cl. 318-606.000.

Clemens, David H.; and Lange, Raymond J., to Rohm and Haas Company. Method of preparing resins containing sulfonic acid functionality involving oxidation of thiouronium salts with hydrogen peroxide. 3,944,507, Cl. 260-2.10R.

Cleveland, Joseph J., to GTE Sylvania Incorporated. Ceramic cellular structure having high cell density and method for producing same. 3,943,994, Cl. 165-10.000.

Clinton, William D., to Signet Controls, Inc. Convertible measuring container. 3,943,772, Cl. 73-429.000.

Coal Industry (Patents) Limited: *See—*
Evans, Frank; and Gillard, Dennis Alfred, 3,943,723.

Coats & Clark, Inc.: *See—*
Einhorn, Ruediger; Chasen, Lee Richard; and Hannes, Karl, 3,944,186.

Cochran-Boothe Airport Systems: *See—*
Carder, Victor H., 3,944,096.

Cockshott, Charles Peter: *See—*
Moore, John Howard; and Cockshott, Charles Peter, 3,944,860.
Moore, John Howard; and Cockshott, Charles Peter, 3,944,861.

Codman & Shurtleff, Inc.: *See—*
Martinez, Miguel, 3,944,342.
Mueller, Werner, Jr., 3,944,343.

Coggins, Dolphus L.; and Werkema, Robert G. Composition for chemical milling refractory metals. 3,944,496, Cl. 252-79.300.

Cohen, Amnon Mordechai, to P.F.W. Beheer B.V. Process for the preparation of 3-mono-alkyl and 3,6-dialkyl-resorcylic esters. 3,944,596, Cl. 260-473.00S.

Cohen, Hyman L.; Koeng, Frederick; and Ponticello, Ignazio, to Eastman Kodak Company. photographic or image recieving elements containing polymeric mordants. 3,944,424, Cl. 96-119.00R.

Cole, Edward L.: *See—*
Hess, Howard V.; Cole, Edward L.; and Franz, William F., 3,944,462.

Coleman, Arthur; Swan, Andrew; and Doig, David, to Veeder Industries, Inc. Key-operated switches. 3,944,762, Cl. 200-44.000.

Coles, Donald K. Keyboard type musical instrument. 3,943,811, Cl. 84-1.010.

Colgate-Palmolive Company: *See—*
Colodney, Daniel; Steinke, John J.; and Mitchell, Robert, 3,944,661.
Egan, Francis L., Jr., 3,943,609.
Schaar, Charles H., 3,943,930.
Weiss, Sidney; Temnikow, Victor; and Eigen, Edward, 3,944,663.

Colin, Claude: *See—*
Farjon, Raymond; Farce, Jacques; Doyelle, Francis; and Colin, Claude, 3,944,373.

Colk, Carl F. G., to Raymond Lee Organization, Inc., The. Vibrator bath and cleaner. 3,943,921, Cl. 128-62.00R.

Collins, John J.: *See—*
Nicholl, Thomas H.; and Collins, John J., 3,944,761.

Colodney, Daniel; Steinke, John J.; and Mitchell, Robert, to Colgate-Palmolive Company. Dentifrices containing iridescent flakes. 3,944,661, Cl. 424-49.000.

Colourvision Associates: *See—*
Sword, Geoffrey; Lawrence, John Leslie; Raggett, Stephen Richard; and Blakemore, Bernard, 3,944,739.

Colton, Roland J. Golf club swing training device. 3,944,233, Cl. 273-186.00R.

Combustion Equipment Associates, Inc.: *See—*
Field, Edwin L.; Lamantia, Charles R.; Lunt, Richard R.; Oberholtzer, James E.; and Valentine, James R., 3,944,649.

Comisar, Gerald G.; and Carter, Fred L., to Compuvote Corporation. Vote-recording apparatus. 3,944,788, Cl. 235-54.00F.

Commissariat a l'Energie Atomique: *See—*
Aubert, Gilles; Lemoine, Roger; Maury, Andre; Moulin, Maurice; and Tomachevsky, Erik, 3,943,756.
Duret, Georges; Place, Georges; and Rousseau, Jean, 3,944,468.

Commonwealth of Australia, The: *See—*
Jones, Neal K.; Langford, Aubrey F. W.; Anderson, Donald; and Crook, Walter R., 3,944,806.

Commonwealth Scientific & Industrial Research Organization: *See—*
Phillips, John Norbert, 3,944,557.

Compac Corporation: *See—*
French, John B., 3,944,455.

Compagnie Europeenne de Manutention: *See—*
Bergeron, Maurice, 3,944,093.

Compagnie Francaise des Petroles, S.A.: *See—*
Lecordier, Michel G., 3,943,982.

Compagnie Generale pour les Developpements Operationnels des Richesses sour-Marines (Doris) S.A.: *See—*
Lecordier, Michel G., 3,943,982.

Compagnie Industrielle Des Telecommunications Cit-Alcatel: *See—*
Brouant, Michel, 3,944,938.
Morgand, Pierre; and Riou, Yves, 3,944,751.

Compagnie Internationale Pour l'Informatique: *See—*
Lazzari, Jean-Pierre, 3,945,038.
Masson, Jean-Jacques, 3,944,973.

Compagnie Internationale Pour L'Informatique - C.I.I.: *See—*
Mayer, Jean Jacques, 3,944,988.

Compagnie Maritime d'Expertises, S.A.: *See—*
Lecordier, Michel G., 3,943,982.

Comptex, Inc.: *See—*
Higgins, David M., 3,944,045.

Comptoir Lyon-Alemond-Louyot: *See—*
LaCroix, Roger Claude, 3,944,505.

Compton, Ralph M. Warp beam dolly. 3,944,094, Cl. 214-390.000.

Compuvote Corporation: *See—*
Comisar, Gerald G.; and Carter, Fred L., 3,944,788.

Connelly, Lawrence K.; and Peters, Clifford M., to ACF Industries, Incorporated. Control valve for fluid actuator. 3,943,974, Cl. 137-624.270.

Consorti, Sebastian John. Laundry bag. 3,943,988, Cl. 150-7.000.

Consumers Glass Company Limited: *See—*
Watson, William Bruce; and Graves, Vernon James, 3,944,104.

Continental Industries, Inc.: *See—*
Stiner, Roy E.; and Gardner, Robert P., 3,944,262.

Control Data Corporation: *See—*
Chudleigh, Walter H., Jr., 3,944,942.

Control Systems Research, Inc.: *See—*
Weit, James G.; and Newcamp, Charles W., 3,944,907.

Conway, David, to AMP Incorporated. Short-circuit protection circuit. 3,944,889, Cl. 317-31.000.

Conway, William N., to Rockwell International Corporation. Picker stick check. 3,943,977, Cl. 139-166.000.

Cook, Charles E. Double track bar system. 3,944,247, Cl. 280-124.00R.

Cooley, Denton A.: *See—*
Reed, Charles C.; Sharp, Russell G.; and Cooley, Denton A., 3,944,261.

Cooper, Douglas. Casting reel spool speed control device. 3,944,160, Cl. 242-84.52C.

Cooper, Eugene A., to BASF Aktiengesellschaft. Video recorder pre-emphasis, de-emphasis circuits. 3,944,853, Cl. 307-237.000.

Cooper, George P., to Rockwell International Corporation. Wide band pulsed energy system. 3,945,012, Cl. 343-17.20R.

Copar Corporation: *See—*
Gallet, Jack R., 3,944,933.

Coppens, Matheus Johannes Martinus, to Koninklijke Emballage Industrie Van Leer B.V. Screw threaded plastic plug. 3,944,114, Cl. 220-288.000.

Corning Glass Works: *See—*
Misulovin, Leonid Yakovlevich; Panin, Igor Ivanovich; Soloveichik, Yakov Girshevich; Kovalev, Leonid Anisimovich; and Zhoglo, Viktor Olimpievich, 3,944,956.
Morgan, David W., 3,944,352.
Sawchuk, Peter, 3,943,620.

Corte, Ernesto; Maitra, Pradeep; and Franklin, Wesley Donald, to General Atomic Company. Noise generator system having amplitude control. 3,944,945, Cl. 331-78.000.

Cotton Incorporated: *See—*
Getchell, Nelson F., 3,944,388.

Coulter Electronics, Inc.: *See—*
Coulter, Wallace H.; and Hogg, Walter R., 3,944,797.
Hogg, Walter R.; Liedholz, Gerhard A.; and Coulter, Wallace H., 3,944,917.

Coulter, Wallace H.; and Hogg, Walter R., to Coulter Electronics, Inc. Method and apparatus for determining the correct percentiles of the size distribution of a particulate system. 3,944,797, Cl. 235-151.300.

Coulter, Wallace H.: *See—*
Hogg, Walter R.; Liedholz, Gerhard A.; and Coulter, Wallace H., 3,944,917.

Coupland, Ralph, to Clayton Dewandre Company Limited. Spring brake units and drainage means therefor. 3,943,831, Cl. 92-86.000.

Courtaulds Limited: *See—*
Poynton, David John, 3,944,384.

Cramer, Clarence W., to Campbell Soup Company. Apparatus and process for cutting chicken. 3,943,600, Cl. 17-11.000.

Crane Co.: *See—*
Holt, James W.; and Meeks, John K., 3,943,967.

Crawford, Donald C.; and Nack, Michael R., to FMC Corporation. Wrapping machine with severing blade in crimping head. 3,943,686, Cl. 53-182.00R.

Creemers, Henricus M. J. C., to Stamicarbon, B.V. Process for the preparation of polybutene-1. 3,944,529, Cl. 260-88.20R.

Criglar, John J.; and Pettler, Peter R., to Plantronics, Inc. Method and apparatus for feedback suppression. 3,944,743, Cl. 179-1.0FS.

Cron, James C.: *See—*
Katzbeck, John W.; and Cron, James C., 3,944,716.

Crook, Walter R.: *See—*
Jones, Neal K.; Langford, Aubrey F. W.; Anderson, Donald; and Crook, Walter R., 3,944,806.

Cros, Modesto. Two-piece plastic closure. 3,944,103, Cl. 215-277.000.

CSF - Compagnie Generale de Telegraphie Sans Fil: *See—*
Trigon, Roland, 3,945,009.

CTS Corporation: *See—*
Zdanys, John; and Kelver, William L., Jr., 3,944,760.

Cummins, Richard W.: *See—*
Manganaro, James L.; Cummins, Richard W.; and Olson, Raymond A., 3,944,548.

Cunningham, Paul M., to Spectradyne, Inc. Burst frequency shift keying data communication system. 3,944,742, Cl. 178-66.00R.

Curci, William A. Building structure supported above ground by a cradle-like means. 3,943,671, Cl. 52-69.000.

Curington, Alfred R., to Bakerdrill, Inc. Bore hole air hammer. 3,944,003, Cl. 173-73.000.

Currie, Bruce L.: *See—*
Folkers, Karl; Johansson, Karl Nils Gunnar; and Currie, Bruce L., 3,944,659.

Cusano, Dominic Anthony, to General Electric Company. Mechanically improved contacts for radiation switches having material that converts from electrically non-conductive to conductive. 3,944,961, Cl. 337-329.000.

Cutchins, Malcolm A.; Foster, Winfred A., Jr.; Orlin, Peter A.; Martin, Fred W.; and Burkhalter, John E., to United States of America, Agriculture. Aerial seeder and method. 3,944,137, Cl. 239-11.000.

Cuthbert, John David; Fehrs, Delmer Lee; and Munro, David Farnham, to Bell Telephone Laboratories, Incorporated. Optical comparator system to separate unacceptable defects from acceptable edge aberrations. 3,944,369, Cl. 356-167.000.

Cutter Laboratories, Inc.: *See—*
Kirkland, W. Dean, 3,943,959.

Cyphert, Lloyd W. Sidewardly movable vehicle seat with enclosure. 3,944,277, Cl. 296-68.000.

Czaja, Robert F.: *See—*
Tull, Roger J.; Czaja, Robert F.; Shuman, Richard F.; and Pines, Seemon H., 3,944,600.

Czajka, Thomas S., to Standard Oil Company. Self-bonding polyethylene trimellitate imide varnish. 3,944,706, Cl. 428-383.000.

Czarnecki, John D.: *See—*
Moonan, William; and Czarnecki, John D., 3,944,115.

Czinger, David B., to Beach Manufacturing, Inc. Printing saddle having self-contained latch. 3,943,852, Cl. 101-415.100.

Dachicourt, Augustin, to Regie Nationale des Usines Renault. Hydropneumatic suspension device. 3,944,197, Cl. 267-64.00R.

Daeninckx, Jean; and Lelaquet, Pierre, to L'Oreal. Holder for additive to flushing water. 3,943,582, Cl. 4-227.000.

Dahlqvist, Jan; Matsson, Bo; and Johansson, Benny, to AGA Aktiebolag. Device for the elimination of the effect of background radiation on the image representation in an ir-camera. 3,944,730, Cl. 178-7.100.

Dai Nippon Toryo Co., Ltd.: *See—*
Okada, Akira; Izumi, Ryoji; Ninomiya, Syogo; Tahara, Yukio; Takehara, Yuji; Suezawa, Masaaki; and Kawasaki, Kazuhiro, 3,944,144.

Daika Kabushiki-Kaisha: *See—*
Ishikawa, Yoshitaka, 3,943,583.

Daikin Kogyo Kabushiki Kaisha: *See—*
Katsushima, Atsuo; Imazu, Shinichi; Fukui, Shoshin; Iwatani, Akitoshi; and Akazawa, Tadashi, 3,944,587.

Dailey, John L. Method and apparatus for determining the time intensity integral of the exposure of a negative onto photographic paper. 3,944,362, Cl. 355-38.000.

Daimler-Benz Aktiengesellschaft: *See—*
Albrecht, Wilhelm, 3,944,244.
Supper, Ottmar, 3,943,784.
Wulf, Helmut; and Schiesterl, Gerhard, 3,944,250.

Dainippon Ink & Chemicals, Incorporated: *See—*
Ito, Shuji, 3,944,726.

Dainippon Printing Co., Ltd.: *See—*
Tsunoda, Ichiro; Takeuchi, Satoshi; Hirao, Yoichiro; Suzuki, Takeo; Nishiue, Yoshihiro; Tadokoro, Katsumasa; Fukagawa, Toshimasa; Harada, Isamu; Misawa, Akira; and Watanabe, Kazuo, 3,944,330.

Dalke, James A.; and Hough, Wayne E., to Metro Data Corporation. Non-interlaced 263 TV line character generation system. 3,944,993, Cl. 340-324.0AD.

Dall, Hans Mathiesen, to A/S Fisker & Nielsen. Vacuum cleaner. 3,943,597, Cl. 15-331.000.

Damon Corporation: *See—*
Green, Charles J., 3,943,656.

Daniel Industries, Inc.: *See—*
Geisow, Bernard H.; and Harrelson, Lamont, 3,943,846.

Danieli, Luigi. Process and device for aiding in opening the tundish nozzle in a continuous casting system. 3,944,116, Cl. 222-1.000.

Daniels, R. Gary, to Motorola, Inc. Ultra thin electronic watch. 3,943,699, Cl. 58-23.0BA.

Danilov, Aldexandr Ivanovich: *See—*
Bykhovsky, David Grigorievich; Danilov, Aldexandr Ivanovich; and Brodsky, Mikhail Shikovich, 3,944,778.

Dankel, Douglas D., to Roper Corporation. Friction clutch for power driven element such as a rotary blade. 3,943,729, Cl. 64-30.00C.

Danko, Arthur Joseph, to Illinois Tool Works Inc. Universal mounting backboard. 3,944,176, Cl. 248-68.00R.

Danneberg, Peter: *See—*
Bauer, Adolf; Weber, Karl Heinz; Minck, Klaus; and Danneberg, Peter, 3,944,579.

D'Antonio, Alfred: *See—*
Schoppee, Lawrence W.; and D'Antonio, Alfred, 3,943,809.

Darmory, Franklin P.; and DiBenedetto, Marianne, to Ciba-Geigy Corporation. Crosslinked resins prepared from an N,N'-bis-imide and a schiff base. 3,944,525, Cl. 260-78.0UA.

Data Source Corporation: *See—*
Kwok, Kenneth, 3,944,979.

Davies, Norman, to Westinghouse Electric Corporation. Circuit breaker with low torque motor. 3,944,772, Cl. 200-153.0SC.

Davis, Delmar B.; and Christensen, Wendell N., to Thiokol Corporation. Catalytic filtering-incinerating process and device for waste water. 3,944,487, Cl. 210-62.000.

Davis, Haggai D. Rotary drilling apparatus and method. 3,943,997, Cl. 166-312.000.

Davis, Oliver Thurston. Dyeing process. 3,944,383, Cl. 8-80.000.

Davis, Roy Forrest, Jr. Continuous air removal valve. 3,943,958, Cl. 137-217.000.

Davy-Loewy Limited: *See—*
Clegg, Roy, 3,944,903.

Davy Powergas GmbH: *See—*
Furkert, Herbert, 3,944,657.

Dayton Sure-Grip & Shore Company, The: *See—*
Mess, Richard C., 3,943,817.

Dean, John Richard: *See—*
Moore, William Cooper; Kiss, John David; and Dean, John Richard, 3,944,809.

Dean, Sheldon W.: *See—*
Pryor, Michael J.; Ford, James A.; and Dean, Sheldon W., 3,944,439.

Dearman, Timothy C. Clamping device for use in making mitered joints in pipe sections. 3,944,202, Cl. 269-130.000.

De Baun, Bruce, to Chevron Research Company. Method and apparatus for predicting the explosiveness of a volume containing inert gas and hydrocarbon vapors when mixed with air. 3,943,775, Cl. 73-432.00R.

De Brabander, Jean Leon Philemon Isidor Pierre, to Velcro S.A. Hooking-up device. 3,943,981, Cl. 139-391.000.

DEC International, Inc.: *See—*
Huang, Min-Nang, 3,943,841.

Decorato, Frank. Optically corrected swimming goggles. 3,944,345, Cl. 351-43.000.

DeCorso, Serafino M.; and Pillsbury, Paul W., to Westinghouse Electric Corporation. Wide range catalytic combustor. 3,943,705, Cl. 60-39.74R.

de Does, Joan Charles, to Verolme Verenigde Scheepswerven B.V. Ship for the transport of liquid or gaseous cargo in tanks. 3,943,872, Cl. 114-74.00R.

Deere & Company: *See—*
Barth, Hubert, 3,944,252.
Fletcher, Edward Horton, 3,943,824.

Deering Milliken Research Corporation: *See—*
Short, Joe T.; Knight, Lee H., Jr.; Frentress, Zane; and Boteler, Winston C., 3,943,865.

Deetz, David R.; Fisk, Bernard C.; VerSchage, Gerald C.; and Donohue, James M., to Xerox Corporation. Programmable controller for controlling reproduction machines. 3,944,360, Cl. 355-14.000.

Defrese, Jesse G. Interlocking joint. 3,944,377, Cl. 403-189.000.

DeGraff, Peter H.: *See—*
Thur, Gerry W.; and DeGraff, Peter H., 3,943,950.

Deguchi, Seiji: *See—*
Ide, Fumio; Kishida, Kazuo; Deguchi, Seiji; and Kaneda, Masahiro, 3,944,630.

Deiss, Jaroslav: *See—*
Kopal, Jaroslav; Jansa, Milos; and Deiss, Jaroslav, 3,943,732.

Delany, Edward B., to Perkin-Elmer Corporation, The. Flame ionization detector status indicator. 3,943,766, Cl. 73-341.000.

De Laune, Jon M., to Motorola, Inc. Phase-locked loop transceiver having automatic frequency offset selectability. 3,944,925, Cl. 325-17.000.

DeLuca, Paul V.: *See—*
Carney, William V.; and DeLuca, Paul V., 3,944,758.
Stearn, Theodore; and De Luca, Paul V., 3,944,752.

Dennis, John J., Jr.; and McCole, Thomas P., to Polaroid Corporation. Photographic film unit having gravure coated, tapered thickness layer. 3,944,701, Cl. 427-288.000.

Dennison Manufacturing Company: *See—*
Sloan, Donald D., 3,944,418.

De Nora, Giovanni: *See—*
Banzoli, Valeriano; De Nora, Giovanni; Di Tella, Vincenzo; Lalli, Domenico; and Tempo, Gianfranco, 3,943,724.

de Rooij, Abraham H.; Elmendorp, Jan; and Wassen, Willem J., to Stamicarbon, B.V. Conversion of ketoximes into lactams in organic sulfoxide solvents. 3,944,542, Cl. 260-239.300.

De Rooij, Abraham H.: *See—*
Goettsch, Reijer; and De Rooij, Abraham H., 3,944,543.

de Rosa, Daniel; and Lacambre, Jacques, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Adjustable seat, especially for motor vehicles. 3,944,276, Cl. 296-65.00R.

Derzhavets, Abram Yakovievich; Kogan, Petr Grigorievich; and Tabachnikov, Viktor Iosifovich. Apparatus for pumping oil-water mixture from a collection vessel of a floating oil collector into settling tanks. 3,944,489, Cl. 210-242.00R.

Desai, Ashok K., to Pertec Corporation. Versatile phase-locked loop for read data recovery. 3,944,940, Cl. 329-122.000.

Deschler, Gerhard: *See—*
Kubis, Heribert; and Deschler, Gerhard, 3,943,908.

Detroit Marine Engineering: *See—*
Adas, Charles L., 3,944,024.

Detterbeck, Heinrich, to Siemens Electrogerate GmbH. Cooking tray with control indicator means. 3,944,786, Cl. 219-453.000.

Deutsche Texaco Aktiengesellschaft: *See—*
Cherubim, Martin; and Abodagga, Faisal, 3,944,559.

Deverell, Christopher: *See—*
Mathews, Carl Fraser; Deverell, Christopher; Pears, Gordon Edmund Alfred; and Knowles, Peter George, 3,944,699.

de Visser, Jacob: *See—*
van den Broek, Albertus Joannes; and de Visser, Jacob, 3,944,576.

DeVito, Joseph; and Tendrup, Donald L. Plastic flower basket. 3,943,661, Cl. 47-35.000.

DiBenedetto, Marianne: *See—*
Darmory, Franklin P.; and DiBenedetto, Marianne, 3,944,525.

Diehl: *See—*
Meisner, Alfred; Oellig, Oskar; Neubauer, Josef; and Kratz, Bernhard, 3,944,795.

Diehl, Francis Louvaine; Zeffren, Eugene; and Milbrada, Edward John, to Procter & Gamble Company, The. Stabilization and enhancement of enzymatic activity. 3,944,470, Cl. 195-63.000.

Dieringer, Andrew M.; and Katcha, Frank F., to Rexnord Inc. Machine for setting tie plates and the like. 3,943,858, Cl. 104-16.000.

Dierks, Robert P.; and Rillie, Robert J., to United States Gypsum Company. Gypsum wallboard and process for making same. 3,944,698, Cl. 428-219.000.

Diesel Kiki Kabushiki Kaisha: *See—*
Takahashi, Seiji; and Kaibara, Nobuhiro, 3,943,901.

Digital Computer Controls, Inc.: *See—*
Montana, Richard L., 3,944,801.

Dimension Weld International Corporation, The: *See—*
Burgheimer, Joanne, 3,944,454.

Dion, C. Norman; and Idemoto, Tom Y., to Dysan Corporation. Method and apparatus for burnishing flexible recording material. 3,943,666, Cl. 51-106.00R.

Dirk, William R., to Lennox Industries Inc. Compressor valving. 3,944,381, Cl. 417-564.000.

Dirks, Chauncey L., to John Z. DeLorean Corporation, The. Composite structure. 3,944,704, Cl. 428-305.000.

Dirne, Adrianus Petrus: *See—*
Asselman, George Albert Apolonia; Dirne, Adrianus Petrus; and Vromans, Petrus Helena Gerardus Maria, 3,943,964.

Dirzhis, Sauljus Antanovich: *See—*
Apsit, Voldemar Voldemarovich; Dombur, Lev Eduardovich; Lutsavs, Yan Yanovich; Pugachev, Vladislav Alexandrovich; Schukin, Mikhail Ivanovich; Dirzhis, Sauljus Antanovich; Karosas, Iozas Ionovich; Pashtukas, Algis Vladislavovich; and Khlavnovich, Leonid Borisovich, 3,944,863.

Dissing, Erik, to Aktiebolaget Atomenergi. Method of and an apparatus for examining a sample or a material by measuring the absorption of γ- or x-ray radiation. 3,944,830, Cl. 250-358.00R.

Dissinger, William K. Louver panel assembly. 3,943,679, Cl. 52-473.000.

Distler, Dieter; Wendel, Kurt; Einwiller, Andreas; and Oppenlaender, Knut, to BASF Aktiengesellschaft. Production of nonwoven fabrics. 3,944,690, Cl. 427-390.000.

Distler, Walter, to Siemens Aktiengesellschaft. Liquid jet recorder. 3,945,022, Cl. 346-75.000.

Distler, Walter: *See—*
Kraus, Helmut; and Distler, Walter, 3,945,020.

Di Tella, Vincenzo: *See—*
Banzoli, Valeriano; De Nora, Giovanni; Di Tella, Vincenzo; Lalli, Domenico; and Tempo, Gianfranco, 3,943,724.

Dittrich, Volker: *See—*
Nikles, Erwin; Dittrich, Volker; and Pinter, Ladislaus, 3,944,674.

Dobbs, Donald G. Combination fly and spinning reel. 3,944,159, Cl. 242-84.20B.

Dobson, Kenneth Rowland, to BP Chemicals International Limited. Esters of tetrahalo-octanols. 3,944,597, Cl. 260-488.00F.

Dockins, Lonnie L. Compensator coupling for logging truck and trailer. 3,944,257, Cl. 280-404.000.

Dr. Ing.h.c.F. Porsche Aktiengesellschaft: *See—*
Lange, Karlheinz, 3,943,710.

Doerman, Eryk Stefan; and Hirsh, Ivan Yehudi, to Molins Limited. Testing of cigarettes. 3,943,752, Cl. 73-41.000.

Doerr, Richard L., to Olin Corporation. Oxidation of vat and sulfur dyes with vanadate activated bromate or iodate. 3,944,382, Cl. 8-34.000.

Doi, Kaname; and Nagara, Hiroaki, to Sumitomo Electric Industries, Ltd. Load responsive pressure modulating valve device for use in a brake system of a vehicle. 3,944,292, Cl. 303-24.00C.

Doig, David: *See—*
Coleman, Arthur; Swan, Andrew; and Doig, David, 3,944,762.

Dolev, Amior: *See—*
Fridman, Eliahu; and Dolev, Amior, 3,944,676.

Dolfini, Joseph E.: *See—*
Perrella, Donald J.; and Dolfini, Joseph E., 3,944,544.

Domann, Helmut: *See—*
Maisch, Wolfgang; and Domann, Helmut, 3,944,014.

Dombur, Lev Eduardovich: *See—*
Apsit, Voldemar Voldemarovich; Dombur, Lev Eduardovich; Lutsavs, Yan Yanovich; Pugachev, Vladislav Alexandrovich; Schukin, Mikhail Ivanovich; Dirzhis, Sauljus Antanovich; Karosas, Iozas Ionovich; Pashtukas, Algis Vladislavovich; and Khlavnovich, Leonid Borisovich, 3,944,863.

Dominion Al-Chrome Corporation: *See—*
Svirklys, Ferdinand M., 3,943,880.

Donachie, Stephen James, to International Nickel Company, Inc., The. Air hardenable, formable steel. 3,944,442, Cl. 148-12.00F.

Donaldson Company, Inc.: *See—*
Hiemstra, John R.; and Wagner, Wayne M., 3,944,265.

Donnelly, Thomas L.; and Mullen, Edward J., to Xerox Corporation. High efficiency non-cavity radiant method and apparatus. 3,944,783, Cl. 219-216.000.

Donohue, James M.: *See—*
Deetz, David R.; Fisk, Bernard C.; VerSchage, Gerald C.; and Donohue, James M., 3,944,360.
Fisk, Bernard C.; VerSchage, Gerald C.; and Donohue, James M., 3,944,359.

Dorleijn, Jan Willem Frederik; Druyvesteyn, Willem Frederik; and Ate de Jonge, Frederik. Magnetic domain logic device. 3,944,842, Cl. 307-88.0LC.

Dorman Smith Switchgear Limited: *See—*
Kidd, Alan Lister, 3,944,959.

Dorr, Karl-Heinz; Grimm, Hugo; Sander, Ulrich; Peichl, Robert; and Tacke, Michael, to Metallgesellschaft Aktiengesellschaft; and Sud-Chemie AG. Process for the removal of gaseous impurities from the exhaust gases of a contact-process plant for the production of sulfuric acid. 3,944,401, Cl. 55-73.000.

Dorsch, Dieter: *See—*
Dosch, Peter; and Dorsch, Dieter, 3,943,692.

Doryokuro Kakunenryo Kaihatsu Jigyodan: *See—*
Akiyama, Takao; Takani, Satoru; and Atsumo, Hideo, 3,943,751.

Dosch, Peter; and Dorsch, Dieter, to APAG Apparatebau AG. Mounting assembly for measuring probe on false-twist machines. 3,943,692, Cl. 57-77.450.

Dow Chemical Company, The: *See—*
Moyle, Clarence L., 3,944,498.
Solomon, Richard A., 3,944,389.
Wing, Milton Silas; and Head, Billy Duane, 3,944,481.

Dow Corning Corporation: *See—*
Clark, Harold A., 3,944,702.
Mink, Alan E.; and Mitchell, Darrell D., 3,944,519.
Skobel, Max, 3,944,459.

Downing, Benjamin A., to Caterpiliar Tractor Co. Combined reinforcing and support means for the corners of a collapsible container. 3,944,073, Cl. 206-503.000.

Doyelle, Francis: *See—*
Farjon, Raymond; Farce, Jacques; Doyelle, Francis; and Colin, Claude, 3,944,373.

Drabert Sohne: *See—*
Riedel, Dieter, 3,943,735.

Drax, Heinz; and Stut, Hans, to Siemens Aktiengesellschaft. Television camera measuring devices. 3,944,737, Cl. 178-7.200.

Driver, Michael C.: *See—*
Kim, He B.; and Driver, Michael C., 3,943,622.

Druyvesteyn, Willem Frederik: *See—*
Dorleijn, Jan Willem Frederik; Druyvesteyn, Willem Frederik; and Ate de Jonge, Frederik, 3,944,842.

D'Souza, Godfrey B., to Canada Packers Limited. Process for puffing borax. 3,944,651, Cl. 423-279.000.

Du-Al Manufacturing Company: *See—*
Mott, Richard H.; and Erlenbusch, Gary L., 3,944,274.

Dubs, Paul; Kuntzel, Heiner; Pesaro, Mario; and Schmidt, Harald, to Givaudan Corporation. 2-Methyl-2-acetyl-thiazolidine. 3,944,561, Cl. 260-306.70R.

Dudko, Daniil Andreevich: *See—*
Paton, Boris Evgenievish; Dudko, Daniil Andreevich; Gvozdetsky, Vasily Stepanovich; Asoyants, Grigory Bagradovich; Sklyarevsky, Vladik Efimovich; Skrypnik, Valentin Ivanovich; and Shmakov, Eduard Ivanovich, 3,944,780.

Duennenberger, Max: *See—*
Schellenbaum, Max; Duennenberger, Max; and Casagrande, Fulvio, 3,944,652.

Dumas, Victor, to Rhone-Poulenc Textile. Synthetic fibers and process for making same. 3,944,708, Cl. 428-400.000.

Dunmire, Paul E. Transit mix system and method, and support for transit mix unit. 3,944,190, Cl. 259-177.00R.

Dunn, Ralph L., to United States of America, Army. Surveillance radar. 3,945,005, Cl. 343-5.0PD.

Du Pont de Nemours, E. I., and Company: *See—*
Barkdoll, Archie E.; and England, David C., 3,944,347.
Bellina, Russell F., 3,944,670.
Fernstrom, George Arvid; and Osborn, James Richard, Jr., 3,944,071.
Gardiner, Robert A.; and Garth, Bruce H., 3,944,397.
Hanke, Albert Robert, 3,944,564.
Larry, John Robert, 3,944,696.
Lupton, John Madison; and Regester, James Williams, 3,944,536.
Mahler, Walter, 3,944,494.
Wilkinson, William Kenneth, 3,944,386.
Wolf, Karl, 3,944,465.

Duret, Georges; Place, Georges; and Rousseau, Jean, to Commissariat a l'Energie Atomique. Fuel pin cluster for a high-power reactor. 3,944,468, Cl. 176-81.000.

Durfee, Daniel G.: *See—*
Yamamoto, Mayjue A., 3,944,027.

Durrell, William S.; and Eckert, Robert J., Jr., to Ciba-Geigy Corporation. Process for the production of cyanogen chloride. 3,944,656, Cl. 423-379.000.

Duttweiler, Donald Lars; and Messerschmitt, David Gavin, to Bell Telephone Laboratories, Incorporated. Block digital processor for use with nonuniformly encoded digital words. 3,945,002, Cl. 340-347.0DD.

Dworetzky, John Peter. Audience response system. 3,943,641, Cl. 35-8.00R.

Dynamics Research and Manufacturing, Inc.: *See—*
Walker, Grant W., 3,944,187.

Dynamit Nobel Aktiengesellschaft: *See—*
Zwicker, Kurt, 3,943,854.

Dysan Corporation: *See—*
Dion, C. Norman; and Idemoto, Tom Y., 3,943,666.

Dziemian, Robert; and Finch, Neville, to Ciba-Geigy Corporation. Treatment of adrenal malfunction. 3,944,671, Cl. 424-267.000.

Dzubay, Thomas G., to United States of America, U. S. Environmental Protection Agency. Polarization excitation device for X-ray fluorescence analysis. 3,944,822, Cl. 250-272.000.

Dzus Fastener Co., Inc.: *See—*
Schenk, Peter, 3,943,611.

E. J. Brooks Company: *See—*
Lundberg, George A., 3,944,269.

E M I Limited: *See—*
Hounsfield, Godfrey Newbold, 3,944,833.

E. R. Squibb & Sons, Inc.: *See—*
Breuer, Hermann; and Treuner, Uwe, 3,944,546.
Chao, Sam T.; Cimarusti, Christopher M.; and Varma, Ravi K., 3,944,584.
Perrella, Donald J.; and Dolfini, Joseph E., 3,944,544.

Eastman Kodak Company: *See—*
Benwood, Bruce R.; and Siebenrock, Howard D., 3,944,354.
Cohen, Hyman L.; Koeng, Frederick; and Ponticello, Ignazio, 3,944,424.
Jadwin, Thomas A.; and Storey, Robert C., 3,944,493.
Petke, Frederick D., 3,944,516.
Ruben, Paul Lewis, 3,944,337.

Easton, Maysel Marie, to Lawrence Peska Associates, Inc., a part interest. Lawn sprinkler and bird bath structure. 3,944,138, Cl. 239-18.000.

Eaton Corporation: *See—*
Walton, Erlen B., 3,943,713.

Eaton, Homer L., to Eaton-Leonard Corporation. Method and apparatus for measuring direction. 3,944,798, Cl. 235-151.300.

Eaton-Leonard Corporation: *See—*
Eaton, Homer L., 3,944,798.

Eaton-Williams, Raymond H. Electrode boiler with automatic control. 3,944,785, Cl. 219-286.000.

Ebauches S.A.: *See—*
Portmann, Hubert; Saurer, Eric; and Hersberger, Pierre, 3,943,696.

Ebeling, Ernest C.: *See—*
Ebeling, Franklin D.; and Ebeling, Ernest C., 3,944,092.

Ebeling, Franklin D.; and Ebeling, Ernest C. Container emptying device. 3,944,092, Cl. 214-302.000.

Eckert, Robert J., Jr.: *See—*
Durrell, William S.; and Eckert, Robert J., Jr., 3,944,656.

Eclair Corporation of America: *See—*
Jones, Peter Ronald Wright, 3,944,349.

Edamatsu, Michisuke: *See—*
Osajima, Yoshihiro; Imao, Syoji; Shinomiya, Tokuo; Mihara, Sirou; and Edamatsu, Michisuke, 3,944,639.

Edwards, Albert, to Baker Perkins Holdings Limited. Method and apparatus for preparing foundry moulds or cores. 3,943,991, Cl. 164-21.000.

Efferson, Kenneth R., to American Magnetics, Inc. Level detector system for cryogenic liquids. 3,943,767, Cl. 73-295.000.

Egan, Francis L., Jr., to Colgate-Palmolive Company. Adhesive diaper fastener with integral adhesive protecting means. 3,943,609, Cl. 24-73.0VA.

Egee, Walter Warren, to Campbell Soup Company. Feeding and mixing apparatus. 3,944,119, Cl. 222-424.000.

Eggert, Walter S., Jr. Vehicle bumper. 3,944,271, Cl. 293-71.00R.

Ehrenberg, Kurt; and Worner, Klaus, to Heinrich Worner Fabrik Fur Autoteile. Gap-sealing structure. 3,943,678, Cl. 52-461.000.

Eichholz, Gunter; and Wehren, Peter, to Klockner-Humboldt-Deutz AG. Grinding mill with excitation member in the charge of material to be comminuted. 3,944,145, Cl. 241-23.000.

Eigen, Edward: *See—*
Weiss, Sidney; Temnikow, Victor; and Eigen, Edward, 3,944,663.
Eilers, Carl G., to Zenith Radio Corporation. Multiple channel FM stereo system. 3,944,747, Cl. 179-15.0BT.
Einhorn, Ruediger; Chasen, Lee Richard; and Hannes, Karl, to Coats & Clark, Inc. Locking pulley assembly and method of making same. 3,944,186, Cl. 254-191.000.
Einwiller, Andreas: *See—*
Distler, Dieter; Wendel, Kurt; Einwiller, Andreas; and Oppenlaender, Knut, 3,944,690.
Eitel, Hans-Georg; Morlock, Waldemar; and Ruf, Dieter, to Eitel KG., Werkzeugmaschinenfabrik. Automatic aligning process and aligning press having a single aligning station. 3,943,746, Cl. 72-384.000.
Eitel KG., Werkzeugmaschinenfabrik: *See—*
Eitel, Hans-Georg; Morlock, Waldemar; and Ruf, Dieter, 3,943,746.
El Cu S.p.A.: *See—*
Cerioni, Renzo Giuseppe, 3,943,687.
Eldred, Rodney D.: *See—*
Thom, Le Roy W.; Eldred, Rodney D.; and Soderquist, Douglas R., 3,944,007.
Eldridge, John D., Jr. Receiver for disposable surgical implements. 3,944,069, Cl. 206-350.000.
Electro-Voice, Incorporated: *See—*
Lininger, Thomas C., 3,944,756.
Electroacustic GmbH: *See—*
Kuhn, Hans-Robert, 3,944,748.
Electron Optics Corporation: *See—*
Carr, W. John, Jr., 3,944,336.
Electronic Engineering Co. of California: *See—*
Linker, Elliott C., 3,944,153.
Electronic Flange Lubricators, Inc.: *See—*
Owen, Albert E., 3,944,025.
Eli Lilly and Company: *See—*
Archer, Robert A., 3,944,673.
Chou, Ta-Sen, 3,944,545.
Tafur, Susan S., 3,944,554.
Elitex, Zavody textilniho strojirenstui, generalni reditalstui: *See—*
Jindra, Jaromir, 3,943,978.
Ellenbecker, Daniel G. Power amplifier with distortion control. 3,944,944, Cl. 330-149.000.
Ellenberger, Jakob, to Ellenberger & Poensgen GmbH. Excess current switching device. 3,944,954, Cl. 335-35.000.
Ellenberger & Poensgen GmbH: *See—*
Ellenberger, Jakob, 3,944,954.
Elliott, James E., to MCA Discovision, Inc. Video disc player with movable mirror for directing light beam onto reflective disc. 3,944,727, Cl. 178-6.60R.
Ellsworth, Arthur W.: *See—*
Samhammer, Clair A.; Ellsworth, Arthur W.; Sullivan, James P.; Artmann, John A.; and Null, Robert A., 3,944,032.
Elmendorp, Jan: *See—*
de Rooij, Abraham H.; Elmendorp, Jan; and Wassen, Willem J., 3,944,542.
Elrod, Fred S. Cutting apparatus. 3,944,379, Cl. 408-79.000.
Emerson Electric Co.: *See—*
Schnittker, William E., 3,943,975.
Van Scoy, Davis A., 3,943,749.
EMF Corporation: *See—*
Greene, Ronald W.; Fagan, Edmund I.; and Keeler, Jack D., 3,944,217.
Energy Conversion Devices, Inc.: *See—*
Wacks, Harvey H., 3,944,357.
Engelhard Minerals and Chemicals Corporation: *See—*
Cheremisinoff, Paul, 3,944,402.
England, David C.: *See—*
Barkdoll, Archie E.; and England, David C., 3,944,347.
Engle, Thomas H.; and Bogenschutz, Thomas M., to General Signal Corporation. Brake system including means for ensuring parking brake release. 3,944,286, Cl. 303-13.000.
Enik, Joseph. Collector box. 3,944,108, Cl. 220-18.000.
Ensinger, James L., to Power Pack Conveyor Company. Modular conveyor. 3,944,054, Cl. 198-118.000.
Entreprise de Recherches et d'Activites Petrolieres Elf: *See—*
Chagny, Jean; Francoise, Guy; and Thevenet, Daniel, 3,944,824.
Epelbaum, Quido C. Convertible car seat and stroller. 3,944,241, Cl. 280-30.000.
Erdman, Otto: *See—*
Hegewaldt, Fritz; Gillhaus, Horst; and Erdman, Otto, 3,944,715.
Erfurt, Horst-Lothar; Kreft, Holger; and Tronsberg, Walter, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Process for the production of a hollow body of revolution and/or container. 3,943,867, Cl. 113-120.00H.
Erlenbusch, Gary L.: *See—*
Mott, Richard H.; and Erlenbusch, Gary L., 3,944,274.
ERNO Raumfahrttechnik GmbH: *See—*
Becker, Klaus, 3,944,172.
Ernst, Donald J. Hanger member. 3,943,606, Cl. 24-3.00R.
Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, to SKF Industrial Trading and Development Company B.V. Supporting the driven wheel hub of a motor vehicle. 3,944,011, Cl. 180-70.00R.
Erving, Eric Robert. Offset spinner. 3,943,651, Cl. 43-42.190.
Essex International, Inc.: *See—*
Wood, Charles G., 3,944,766.
Etablissements Bertrand Faure: *See—*
Fourrey, Francois, 3,944,302.
ETA A.G. Ebauches-Fabrik: *See—*
Hofer, Peter, 3,943,694.
Etablissement Studia Technica: *See—*
Chollet, Albert, 3,944,105.
Etablissements Nativelle, S.A.: *See—*
Adembri, Giorgio; Tedeschi, Piero; Ponticelli, Fabio; and Marini, Maresco, 3,944,563.
Etat Francais: *See—*
Bizien, Jean-Pierre; Patouilliart, Rene G.; and George, Michel, 3,944,168.
Ramont, Jacques P. A.; Jean, Andre C.; Puydebois, Leon M.; Rousse, Claude R.; and Massay, Michel, 3,943,856.
Ethicon, Inc.: *See—*
Gertzman, Arthur A., 3,943,933.
Ethyl Corporation: *See—*
Kinsley, Homan Benjamin, Jr., 3,943,984.
Etudes Petrolieres Marines, S.A.R.L.: *See—*
Lecordier, Michel G., 3,943,982.
Eubank, Marcus P. Pre-stressed, pre-fabricated concrete supporting structure for a mobile home. 3,944,242, Cl. 280-30.000.
Evanega, George R.; Kuhla, Donald E.; and Sarges, Reinhard, to Pfizer Inc. 4-Substituted-1-piperidinesulfonamides. 3,944,524, Cl. 260-293.690.
Evans, Frank; and Gillard, Dennis Alfred, to Coal Industry (Patents) Limited. Mine roof support equipment. 3,943,723, Cl. 61-45.00D.
Evans, Leo G.: *See—*
Ruthel, Walter W.; and Evans, Leo G., 3,944,479.
Evans, Michael J., to Mayco Equipment Co., Inc. Hoist apparatus. 3,944,185, Cl. 254-175.500.
Evans, Thomas E.: *See—*
Jenne, Richard L.; Marcoux, Leo; and Evans, Thomas E., 3,944,970.
Expo Nord AB: *See—*
Persson, Eric Sigfrid, 3,944,308.
Exxon Research & Engineering Co.: *See—*
Holt, Eugene L., 3,943,709.
Suto, Munehisa; Itoh, Takuji; Tagaya, Nobuaki; and Obayashi, Takashi, 3,944,503.
Fagan, Edmund I.: *See—*
Greene, Ronald W.; Fagan, Edmund I.; and Keeler, Jack D., 3,944,217.
Fallos, George, to Bell and Howell Company. High speed document handler. 3,944,209, Cl. 271-4.000.
Fallos, George; and Morrison, Wilbur J., to Bell and Howell. High speed document handler. 3,944,213, Cl. 271-10.000.
Fallos, George; and Kissawetter, James E., to Bell and Howell Company. High speed document handler. 3,944,214, Cl. 271-10.000.
Fanshawe, David Geoffrey James, to U.S. Philips Corporation. Liquid level sensor. 3,944,994, Cl. 340-244.00R.
Farce, Jacques: *See—*
Farjon, Raymond; Farce, Jacques; Doyelle, Francis; and Colin, Claude, 3,944,373.
Farjon, Raymond; Farce, Jacques; Doyelle, Francis; and Colin, Claude, to Baignol & Farjon S.A. Perforator. 3,944,373, Cl. 402-1.000.
Farkas, Paul, to Thomas & Betts Corporation. Bundling strap. 3,943,608, Cl. 24-16.0PB.
Faro, Hans-Peter: *See—*
Symchowicz, Samson; and Faro, Hans-Peter, 3,944,675.
Farrell, John J. Plasticizer apparatus for ball agitator along screw flights. 3,944,192, Cl. 259-191.000.
Farrell, John J., to Farrell Patent Company. Method for balloon blown plastic molding. 3,944,645, Cl. 264-237.000.
Farrell Patent Company: *See—*
Farrell, John J., 3,944,645.
Farthouat, Anne; and Meier, Jean, to Roussel Uclaf. N-(quinolyn)-anthranilates. 3,944,555, Cl. 260-287.0AR.
Fasano, Thomas, to Lawrence Peska Associates, Inc., a part interest. Glove and hand exerciser. 3,944,220, Cl. 272-67.000.
Fathauer, Jack E., to Midland-Ross Corporation. Cargo container spreader with articulated structure for skewing and tilting. 3,944,272, Cl. 294-81.0SF.
Faulhaber, Fritz, to Retobina Handelsanstalt. Air-core armature. 3,944,857, Cl. 310-266.000.
Federal-Mogul Corporation: *See—*
Bingle, Gerald L., 3,944,307.
Gordon, Alexander L., 3,944,235.
Federal Sign and Signal Corporation: *See—*
Flinn, Leo E., 3,944,174.
Feehery, William J., Jr., to Campbell Soup Company. Pivoted bucket conveyor. 3,944,056, Cl. 198-146.000.
Feeney, Thomas E. Golf game. 3,944,229, Cl. 273-134.0AE.
Feher, Ivan: *See—*
Solymar, Karoly; Zambo, Janos; Orban nee Kelemen, Marika; Bujdoso, Erno; Feher, Ivan; Ozvald, Zoltan; Voros, Istvan; Ferenczi, Tibor; Toth, Pal; Lazar, Ferenc; Pinter, Tihamer; Sigmond, Gyorgy; Siklosi, Peter; Wentzely, Kalman; Lengyel, Laszlo; and Matyasi, Jozsef, 3,944,648.
Feher, Kamilo, to RCA Corporation. Timing technique for NRZ data signals. 3,944,926, Cl. 325-38.00R.
Fehrs, Delmer Lee: *See—*
Cuthbert, John David; Fehrs, Delmer Lee; and Munro, David Farnham, 3,944,369.
Feighery, James M.; and Lewallyn, Michael A., to J. M. Feighery Company. Carpet sewing machine. 3,943,864, Cl. 112-7.000.
Feinstein, Robert: *See—*
Harris, Nick S.; and Feinstein, Robert, 3,944,391.

Fell, Peter Howard: *See—*
Kent, Alan Hugh; and Fell, Peter Howard, 3,944,328.

Ferenczi, Tibor: *See—*
Solymar, Karoly; Zambo, Janos; Orban nee Kelemen, Marika; Bujdoso, Erno; Feher, Ivan; Ozvald, Zoltan; Voros, Istvan; Ferenczi, Tibor; Toth, Pal; Lazar, Ferenc; Pinter, Tihamer; Sigmond, Gyorgy; Siklosi, Peter; Wentzely, Kalman; Lengyel, Laszlo; and Matyasi, Jozsef, 3,944,648.

Fernsteuergerate, Kurt Oelsch KG: *See—*
Lieber, Hans-Wilhelm, 3,944,390.

Fernstrom, George Arvid; and Osborn, James Richard, Jr., to Du Pont de Nemours, E. I., and Company. Filamentary tow package and method for making. 3,944,071, Cl. 206-388.000.

Ferranti Limited: *See—*
Grundy, David Latham; and Hughes, Kenneth Lawson, 3,945,032.

Ferrari, Giorgio; and Krepinsky, Jiri Jan, to Simes Societa Italiana Medicinali e Sintetici S.p.A. Carbamates of ergolines. 3,944,582, Cl. 260-285.500.

Ferrari, Leonard A., to Bell & Howell Company. Video information recording and reproduction. 3,944,728, Cl. 178-6.60A.

Ferris, Ray L.; and Marulic, Walter J., to Pullman Incorporated. Fifth wheel plate assembly. 3,944,375, Cl. 403-13.000.

Fetchin, John Allan; and Marzluff, William Frank, to American Cyanamid Company. Catalyst preparation method. 3,944,609, Cl. 260-561.00N.

Fiat-Allis Construction Machinery, Inc.: *See—*
McRay, Ferris L., 3,944,035.

Fichtel & Sachs AG: *See—*
Kreuzer, Dieter, 3,944,270.

Field, Edwin L.; Lamantia, Charles R.; Lunt, Richard R.; Oberholtzer, James E.; and Valentine, James R., to Combustion Equipment Associates, Inc. Multistage process for removing sulfur dioxide from stack gases. 3,944,649, Cl. 423-242.000.

Fielder, William Van Buren, Jr., to Roper Corporation. Arm construction for drapery master slide. 3,943,598, Cl. 16-93.00D.

Figler, Burton D.; and Nussdorfer, Theodore J., to Sanders Associates, Inc. Radiation detection apparatus. 3,944,167, Cl. 244-3.160.

Finch, Neville: *See—*
Dziemian, Robert; and Finch, Neville, 3,944,671.

Fineman, Sol. Card shuffler. 3,944,230, Cl. 273-149.00R.

Finike Italiana Marposs, Soc. In Accomandita Semplice di Mario Possati & C.: *See—*
Albertazzi, Gastone, 3,943,632.

Firmenich S.A.: *See—*
Becker, Joseph J.; Hochstrasser, Ulrich P.; and Skorianetz, Werner, 3,944,620.

Fisch, Reinhold. Pulling attachment for elbow. 3,944,184, Cl. 254-134.30R.

Fischer, Boguslav H.: *See—*
Wexler, Paul; and Fischer, Boguslav H., 3,943,938.

Fischer, Richard L.: *See—*
Chudgar, Anil H.; Fischer, Richard L.; and Holmgren, Marvin E., 3,944,453.

Fisher, Howard M.; Albers, Bernd G.; and Mrozek, John W., to Pennsylvania Engineering Corporation. Bottom handling apparatus for steel converter vessels. 3,944,083, Cl. 214-1.00D.

Fisher, John B.; and Scott, Donald W., to Scott-Fisher Development Company. Pneumatically cleared toy slate. 3,943,643, Cl. 35-66.000.

Fisher, John M., to B. F. Goodrich Company, The. Releasable restraint in an inflatable emergency evacuation slide. 3,944,023, Cl. 182-48.000.

Fisk, Bernard C.; VerSchage, Gerald C.; and Donohue, James M., to Xerox Corporation. Programmable controller for controlling reproduction machines. 3,944,359, Cl. 355-14.000.

Fisk, Bernard C.: *See—*
Deetz, David R.; Fisk, Bernard C.; VerSchage, Gerald C.; and Donohue, James M., 3,944,360.

Fitzpatrick, Lawrence J. System and method of recording event information for subsequent analysis. 3,944,796, Cl. 235-151.000.

FKF Berlin Fleischwaren und Konservenfabrik, Schulz & Berndt GmbH & Co. KG: *See—*
Holz, Heinz, 3,944,109.

Fleischman, Andor A., to Bell & Howell Company. Short focal length long back focus objective. 3,944,338, Cl. 350-220.000.

Fleissner, Heinz, to Vepa AG. Apparatus for the continuous treatment of textile material. 3,943,734, Cl. 68-5.00D.

Flemming, John Paul. Lawn edge trimming implement. 3,943,998, Cl. 172-17.000.

Fletcher, Edward Horton, to Deere & Company. Hydraulic system. 3,943,824, Cl. 91-363.00A.

Flinn, Leo E., to Federal Sign and Signal Corporation. Derail wheel crowder. 3,944,174, Cl. 246-163.000.

Flood, Donald S., to Flood, Robert J., a part interest. Method for loading grain cars. 3,944,090, Cl. 214-152.000.

Flood, Robert J.: *See—*
Flood, Donald S., 3,944,090.

Flournoy, Kenoth H.; Cardenas, Ricardo L.; and Carlin, Joseph T., to Texaco Inc. Pipeline transportation of viscous hydrocarbons. 3,943,954, Cl. 137-13.000.

FMC Corporation: *See—*
Crawford, Donald C.; and Nack, Michael R., 3,943,686.
Gresham, John T., 3,944,633.
Manganaro, James L.; Cummins, Richard W.; and Olson, Raymond A., 3,944,548.
Montgomery, Ronald Eugene; and Incho, Harry Hobart, 3,944,666.
Mumma, Harold J., 3,944,047.

FMN Schuster & Co.: *See—*
Hermanns, Peter, 3,944,166.

Foley, James P. Telephone index devices. 3,943,649, Cl. 40-336.000.

Foley, Kevin M.; McCombs, Frank Paul; and Bell, Reuben H., to Owens-Corning Fiberglas Corporation. Molding compounds. 3,944,515, Cl. 260-38.000.

Foley, Kevin M.; and Vigo, Francesco M., to Owens-Corning Fiberglas Corporation. Glass fibers coated with compositions containing complex organo silicon compounds. 3,944,707, Cl. 428-391.000.

Folkers, Karl; Johansson, Karl Nils Gunnar; and Currie, Bruce L. Folliculotropin releasing hormone. 3,944,659, Cl. 424-1.000.

Fong, Kouan, to General Electric Company. Station for power line access data system. 3,944,723, Cl. 178-3.000.

Fong, Kouan, to General Electric Company. Receiver filtering out both systematic pulse noise and random noise. 3,944,932, Cl. 325-427.000.

Foote, Alfred F., to C.F.K. Engineering Company. Front loading and ejecting waste removal vehicle. 3,944,098, Cl. 214-519.000.

Foote, Daniel J., to Master Lock Company. Outboard motor lock. 3,943,738, Cl. 70-232.000.

Ford, James A.; and Butt, Sheldon H., to Olin Corporation. Catalyst for the diminution of automobile exhaust gases. 3,944,504, Cl. 252-455.00R.

Ford, James A.: *See—*
Pryor, Michael J.; Ford, James A.; and Dean, Sheldon W., 3,944,439.

Ford Motor Company: *See—*
Foster, Albert W., 3,944,017.

Forster, Denis: *See—*
Hershman, Arnold; and Forster, Denis, 3,944,604.

Foster, Albert W., to Ford Motor Company. Suspension for truck cab. 3,944,017, Cl. 180-89.00A.

Foster Wheeler Energy Corporation: *See—*
Welden, Robert P.; and O'Connor, Lawrence V., 3,944,142.

Foster, Winfred A., Jr.: *See—*
Cutchins, Malcolm A.; Foster, Winfred A., Jr.; Orlin, Peter A.; Martin, Fred W.; and Burkhalter, John E., 3,944,137.

Fourrey, Francois, to Etablissements Bertrand Faure. Sliding runners, especially for seats in vehicles. 3,944,302, Cl. 308-6.00R.

Fowler, John T., to Laitram Corporation, The. Photoelectric control circuit for digital magnetic compass. 3,944,813, Cl. 250-205.000.

Fraikin, Hubert: *See—*
Piret, Pierre; Fraikin, Hubert; and Hubert, Armand, 3,944,836.

France, Edward LeRoy: *See—*
Bills, Jay P.; and France, Edward LeRoy, 3,943,842.

France, Rode. Electronic security apparatus. 3,944,976, Cl. 340-146.200.

Francis, Ralph M., Jr., to Milwaukee Resistor Corporation. False triggering prevention circuit. 3,944,934, Cl. 328-119.000.

Francoise, Guy: *See—*
Chagny, Jean; Francoise, Guy; and Thevenet, Daniel, 3,944,824.

Franklin Press, Inc.: *See—*
Racca, Wilvin W., 3,943,839.

Franklin, Wesley Donald: *See—*
Corte, Ernesto; Maitra, Pradeep; and Franklin, Wesley Donald, 3,944,945.

Franks, Joseph; and Baghurst, Dennis John, to Ion Tech Limited. Hollow cathode type ion source system including anode screen electrodes. 3,944,873, Cl. 315-111.800.

Frantti, Edsel W.; and Antol, Ronald F., to White-Westinghouse Corporation. Infrared lamp holder. 3,944,807, Cl. 240-11.20R.

Franz, Helmut, to PPG Industries, Inc. Selective reflecting metal/metal oxide coatings using surfactant to promote uniform oxidation. 3,944,440, Cl. 148-6.300.

Franz Plasser Bahnbaumaschinen Industriegesellschaft MBH: *See—*
Theurer, Josef, 3,943,857.

Franz, William F.: *See—*
Hess, Howard V.; Cole, Edward L.; and Franz, William F., 3,944,462.

Frappe, Pierre, to Verdol S.A. Punching machine for cards or paper bands to be used for the control of jacquards, dobbies and the like. 3,944,134, Cl. 234-111.000.

Frechette, Jean-Paul. Submarine boat. 3,943,869, Cl. 114-16.00E.

Freeman, Lawrence M.; and Arnold, Francis T. Paper cassette. 3,944,148, Cl. 242-55.530.

French, John B., to Compac Corporation. Labelling system and cassette label applicator usable therewith. 3,944,455, Cl. 156-361.000.

Frentress, Zane: *See—*
Short, Joe T.; Knight, Lee H., Jr.; Frentress, Zane; and Boteler, Winston C., 3,943,865.

Freudenschuss, Otto, to Vockenhuber, Karl; and Hauser, Raimund. Method of and means for checking the correlation of two data carriers. 3,944,348, Cl. 352-5.000.

Freytag, Donald R.: *See—*
Lee, Frank X.; Krimsky, Leonard C.; and Freytag, Donald R., 3,944,151.

Frezza, Robert, to Samcoe Holding Corporation. Tucking device for batching and doffing a fabric web. 3,944,149, Cl. 242-56.00R.

Fridman, Eliahu; and Dolev, Amior, to Centre for Industrial Research (CIR) Ltd. Process for the manufacture of soybean protein products. 3,944,676, Cl. 426-46.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Lindermann, Herbert; and Niemeyer, Ludwig, 3,943,634.

Friedman, Herman H.; and Moreno, Victor, to General Foods Corporation. Foods containing salts of acetyl amino acids as water binders. 3,944,681, Cl. 426-615.000.

Friedman, Jack. Container. 3,944,125, Cl. 229-3.100.

Frisz, James O.; and Price, Harold A., to Watson Industrial Properties. Material handling facility and apparatus therefor. 3,944,086, Cl. 214-17.0DA.

Fritsch, Robert A., to Harnischfeger Corporation. Locking means for relatively movable boom sections of boom of mobile crane. 3,944,082, Cl. 212-144.000.

Fritsch, Rudolf Paul; and Bohnert, Eckhard Reiner. Apparatus for drying strands of plastics material during the manufacture of plastics granules. 3,943,640, Cl. 34-242.000.

Fritz, Rainer: *See—*
Beck, Manfred; Fritz, Rainer; and Theisen, Dieter, 3,944,533.

Froberg, Robert W., to Pfizer Inc. Method for vapor depositing pyrolytic carbon on porous sheets of carbon material. 3,944,686, Cl. 427-228.000.

Frommeld, Hans-Dieter; and Rauhut, Herbert, to Keuffel & Esser Company. Light-sensitive diazotype material comprising a fluoroalkoxy-substituted diazonium compound. 3,944,423, Cl. 96-91.00R.

Fuji Flavor Company, Limited: *See—*
Takahara, Hiroyasu; Morishita, Isao; Shiga, Mikio; and Uchijima, Toshikatsu, 3,944,679.

Fuji Photo Film Co., Ltd.: *See—*
Katsuyama, Harumi; and Ono, Hisatake, 3,944,556.
Matsukawa, Hiroharu; Saeki, Keiso; and Shimada, Takeo, 3,944,502.
Suwama, Toshitaka; and Murakoshi, Makoto, 3,945,018.

Fujioka, Hironari; Matsushita, Takao; and Higaki, Taiji, to Kanzaki Paper Manufacturing Company, Ltd. Electrostatic recording material and manufacture thereof. 3,944,705, Cl. 428-331.000.

Fujisawa, Seiji; and Michioka, Toru, to Matsushita Electric Industrial Co., Ltd. Broad-band signal transmitting device using transformer. 3,944,937, Cl. 328-167.000.

Fujita, Kinji, to Kabushiki Kaisha Suwa Seikosha. Electronic watch. 3,943,697, Cl. 58-23.0BA.

Fujita, Taketoshi: *See—*
Sennari, Mutsuo; Izumi, Yoichiro; and Fujita, Taketoshi, 3,944,534.

Fujitsu Limited: *See—*
Murase, Kenji; and Andoh, Shizuo, 3,944,740.
Owaki, Kenichi; Urade, Toshinori; and Hirose, Tadatsugu, 3,944,875.

Fujiwara, Yasuhiko: *See—*
Hirashima, Kenzo; and Fujiwara, Yasuhiko, 3,944,764.

Fukagawa, Toshimasa: *See—*
Tsunoda, Ichiro; Takeuchi, Satoshi; Hirao, Yoichiro; Suzuki, Takeo; Nishiue, Yoshihiro; Tadokoro, Katsumasa; Fukagawa, Toshimasa; Harada, Isamu; Misawa, Akira; and Watanabe, Kazuo, 3,944,330.

Fukui, Shoshin: *See—*
Katsushima, Atsuo; Imazu, Shinichi; Fukui, Shoshin; Iwatani, Akitoshi; and Akazawa, Tadashi, 3,944,587.

Fuller, David L., to Fuller, David L. Sensing device and method. 3,943,773, Cl. 73-432.00A.

Funkhouser, Richard L.: *See—*
Rasmussen, Donald C.; and Funkhouser, Richard L., 3,944,211.

Furkert, Herbert, to Davy Powergas GmbH. Sulfur dioxide from by-product ammonium sulfate solutions. 3,944,657, Cl. 423-541.00A.

Furukawa, Hiroshi: *See—*
Tajima, Akira; Hirose, Ryusho; Hosoe, Kazuya; Furukawa, Hiroshi; and Ichiyanagi, Toshikazu, 3,944,324.

Furuta, Mithuru: *See—*
Takahashi, Kunihiro; Aya, Norimoto; Osaka, Kenji; and Furuta, Mithuru, 3,944,278.

Gabbert, James D.: *See—*
Hedrick, Ross Melvin; and Gabbert, James D., 3,944,629.

Gade, Ernst-August. Arrangement for protecting the gonads in X-ray diagnostics. 3,944,838, Cl. 250-515.000.

Gaide, Rene, to Societe Fulmen; and Manufacture D'Accumulateurs et D'Objets Moules. Electrical connection between groups of lead plates for electric accumulator elements and method for forming the same. 3,944,436, Cl. 136-176.000.

Gainesville Machine Company, Inc.: *See—*
Norwood, Haskell J., 3,943,599.

Gale, Michael Thomas; and Kane, James, to RCA Corporation. Generation of permanent phase holograms and relief patterns in durable media by chemical etching. 3,944,420, Cl. 96-36.000.

Gale, Pliny M., to Texas Instruments Incorporated. Expandable data storage for a calculator system. 3,944,983, Cl. 340-172.500.

Gallagher, Ruth E.: *See—*
Yu, Arthur J.; and Gallagher, Ruth E., 3,944,631.

Gallaher Limited: *See—*
Boyd, Dennis; and Porter, George, 3,943,941.

Gallegos, Ramon. Method and apparatus for isolation of hair from treatment materials. 3,943,946, Cl. 132-39.000.

Gallet, Jack R., to Copar Corporation. Jam detection circuit. 3,944,933, Cl. 328-5.000.

Galoian, Armen Anushavanovich; Alexanian, Ruben Arshakovich; and Oganian, Mavra Vagarshanovna. Novel biologically-active compounds and method for isolating them from raw materials containing insulin. 3,944,665, Cl. 424-101.000.

Gamo, Ryouji: *See—*
Takada, Keisuke; Gamo, Ryouji; and Sato, Ikuo, 3,943,765.

Gancy, Alan B.; and Poncha, Rustom P., to Allied Chemical Corporation. Production of low bulk density product from sodium bicarbonate. 3,944,500, Cl. 252-182.000.

Ganderton, Peter Clifton, to Autonnic Limited. Pre-set positioning device. 3,943,779, Cl. 74-10.330.

Gannett, Danforth K., to Bell Telephone Laboratories, Incorporated. Matrix coding secret signalling system. 3,944,744, Cl. 179-1.50R.

Gannett, Danforth K., to Bell Telephone Laboratories, Incorporated. Secret signaling system with means for preventing key disclosure. 3,944,745, Cl. 179-1.50R.

Garcia, Uville A. Operation counter for cable actuated mechanical clutches. 3,944,793, Cl. 235-92.0PD.

Gardiner, Robert A.; and Garth, Bruce H., to Du Pont de Nemours, E. I., and Company. Motor fuel composition containing mannich condensation products. 3,944,397, Cl. 44-58.000.

Gardner, Robert P.: *See—*
Stiner, Roy E.; and Gardner, Robert P., 3,944,262.

Garner, Derek H.; and Quarmby, Robert C., to USM Corporation. Adhesive applying arrangement for the insoles of shoes. 3,943,885, Cl. 118-411.000.

Garner, Howell D., to United States of America, General Counsel-Code GP. Magnetic heading reference. 3,943,763, Cl. 73-178.00R.

Garrett Corporation, The: *See—*
Kampe, Johannes F. E., 3,944,380.

Garth, Bruce H.: *See—*
Gardiner, Robert A.; and Garth, Bruce H., 3,944,397.

Garvey Corporation: *See—*
Garvey, Francis J., 3,944,059.

Garvey, Francis J., to Garvey Corporation. Endless chain conveyor link. 3,944,059, Cl. 198-189.000.

Gatellier, Christian; and Olette, Michel, to Institut de Recherches de la Siderurgie Francaise. Process for desulfurizing molten metals. 3,944,476, Cl. 204-140.000.

GEA Luftkuehlergesellschaft Happel GmbH & Co. KG: *See—*
Schuldenberg, Franz J.; and Gerz, Hans-Bernd, 3,944,636.

Geisow, Bernard H.; and Harrelson, Lamont, to Daniel Industries, Inc. Method and apparatus for impressing identifying characters into metal bar stock. 3,943,846, Cl. 101-4.000.

Gelbein, Abraham P.: *See—*
Paustian, John E.; and Gelbein, Abraham P., 3,944,598.

Gelfand, Daniel, to Buchler Instruments, Div. of Searle Analytic, Inc. Moisture sensing systems for electrically operated liquid-handling devices. 3,943,983, Cl. 141-192.000.

Genakis, Joseph M. Pin tumbler lock. 3,943,739, Cl. 70-419.000.

General American Transportation Corporation: *See—*
Heisterberg, Milton W., 3,944,113.

General Atomic Company: *See—*
Corte, Ernesto; Maitra, Pradeep; and Franklin, Wesley Donald, 3,944,945.

General Crane Industries Limited: *See—*
Wellman, Donald E., 3,944,081.

General Electric Company: *See—*
Cusano, Dominic Anthony, 3,944,961.
Fong, Kouan, 3,944,723.
Fong, Kouan, 3,944,932.
Grindle, James L., 3,944,810.
Harris, Samuel C., Jr.; and Jones, Clifford M., 3,944,741.
Hartman, David K., 3,943,621.
Jewell, James G.; Kelley, Fred W., Jr.; and Titus, Charles H., 3,944,919.
Koenig, Thomas J., 3,944,312.
Kotos, Peter; and Yen, Patrick P., 3,944,957.
Little, David W., 3,944,890.
Lynch, David P., 3,944,881.
Nash, Dudley O., 3,943,707.
Quinn, Clayton B.; and Williams, Frank J., 3,944,517.
Quinn, Clayton B., 3,944,583.
Shepard, Wayland L., 3,944,736.
Vosburgh, Kirby G., 3,944,835.
Walter, John L., 3,944,416.
Wilbur, Donald A.; and Peters, Philip H., Jr., 3,944,872.

General Foods Corporation: *See—*
Friedman, Herman H.; and Moreno, Victor, 3,944,681.
Katz, Saul N., 3,944,677.

General Motors Corporation: *See—*
Byrne, James C., 3,943,904.
Kubicek, Edward A., 3,944,046.

General Science Corporation: *See—*
Baxter, Robert, Jr., 3,944,791.

General Signal Corporation: *See—*
Bradley, Earl H., 3,943,955.
Engle, Thomas H.; and Bogenschutz, Thomas M., 3,944,286.

Genevieve I. Hanscom, Robert Magnuson, Lois J. Thomson, trustees of the estate of Roy M. Magnuson: *See—*
Green, Chester, 3,944,077.

Geno Corporation: *See—*
Chandler, Roy L., 3,944,972.

Genova, Inc.: *See—*
Pepper, Kenneth V., 3,944,770.

Gentex Corporation: *See—*
Aileo, Jackson A., 3,943,572.

George, Michel: *See—*
Bizien, Jean-Pierre; Patouilliart, Rene G.; and George, Michel, 3,944,168.

George, Rudolf: *See—*
Stoffers, Helmut; George, Rudolf; Niemann, Helmut; and Rudszinat, Willy, 3,943,944.
Georgia-Pacific Corporation: *See—*
Neal, John A., 3,944,625.
Georgia Tech Research Institute: *See—*
Orr, Clyde, Jr., 3,943,754.
Gerlach, Charles R., to Anderson, John M. Carburetor idling system. 3,944,634, Cl. 261-41.00D.
Gerontakis, Basil G. Variable brightness light display apparatus. 3,944,878, Cl. 315-316.000.
Gertsch AG: *See—*
Sollak, Johann; and Waczek, Otto, 3,943,882.
Weigl, Erwin; and Svoboda, Josef, 3,944,238.
Gertzman, Arthur A., to Ethicon, Inc. Suture with radiation degradation near needle-suture junction. 3,943,933, Cl. 128-339.000.
Gerz, Hans-Bernd: *See—*
Schuldenberg, Franz J.; and Gerz, Hans-Bernd, 3,944,636.
Gesellschaft fur Kernforschung mbH: *See—*
Gspann, Jurgen, 3,944,399.
Pollanz, Herwig, 3,943,774.
Gestetner Limited: *See—*
Maynard, Michael, 3,943,850.
Getchell, Nelson F., to Cotton Incorporated. Method for improving abrasion and wear resistance of edge portions of durable press garments. 3,944,388, Cl. 8-116.400.
Giampa, Anthony J. Electric terminal fitting. 3,944,319, Cl. 339-269.000.
Gilbert, Clifford W., to Gilbert Guitars, Inc. Illuminated guitar. 3,943,815, Cl. 84-293.000.
Gilbert Guitars, Inc.: *See—*
Gilbert, Clifford W., 3,943,815.
Gilbert, Roswell W., to Motor Finance Corporation. Electrical switching device and modulator using same. 3,944,852, Cl. 307-229.000.
Gillard, Dennis Alfred: *See—*
Evans, Frank; and Gillard, Dennis Alfred, 3,943,723.
Gillhaus, Horst: *See—*
Hegewaldt, Fritz; Gillhaus, Horst; and Erdman, Otto, 3,944,715.
Gilmore, Eleanor L.: *See—*
Bhaskar, Surindar N.; Selting, Wayne J.; Gilmore, Eleanor L.; and Gross, Arthur, 3,943,592.
Giraud, Adrien: *See—*
Azalbert, Jean-Paul; Giraud, Adrien; Tassin, Claude J.; and Pech, Christian H., 3,943,721.
Girling Limited: *See—*
Newstead, Charles; and Wright, Andrew Charles Walden, 3,943,829.
Givaudan Corporation: *See—*
Dubs, Paul; Kuntzel, Heiner; Pesaro, Mario; and Schmidt, Harald, 3,944,561.
Glasgow, John Arthur, to Marconi Company Limited, The. Radar system employing consecutive pulses only one of which is frequency swept. 3,945,011, Cl. 343-17.2PC.
Glaverbel-Mecaniver: *See—*
Plumat, Emile; and Mairesse, Jean-Pierre, 3,944,713.
Global Marine Inc.: *See—*
Person, Abraham; and Bolding, Vance E., 3,943,868.
Globe Glass & Trim Company: *See—*
Ogron, Bernard L., 3,944,461.
Gloviak, Tom J., to Skil Corporation. Power hammer. 3,943,782, Cl. 74-50.000.
Gobran, Ramsis, to Minnesota Mining and Manufacturing Company. Poly(phenol/diene) resin and rubber adhesive compositions tackified therewith. 3,944,523, Cl. 260-62.000.
Goebels, Hermann J.; Riesenberg, Klaus-Otto; and Rembold, Helmut, to Robert Bosch GmbH. Motor vehicle brake system wheel lock prevention device. 3,944,290, Cl. 303-21.00F.
Goettsch, Reijer; and De Rooij, Abraham H., to Stamicarbon, B.V. Process for recovery of ε-caprolactam. 3,944,543, Cl. 260-239.30A.
Gohr, Robert A., to Northwest Engineering Company. Load holding device for mobile power crane excavators and the like. 3,944,099, Cl. 214-762.000.
Goldman, Douglas. Method and means for filtering and amplifying signal components of desired frequency. 3,945,035, Cl. 360-7.000.
Goldman, Melvin: *See—*
Kronman, Joseph H.; and Goldman, Melvin, 3,943,628.
Gonzalez, David A.; and Peacock, Odette A., to Raymond Lee Organization, Inc., The, a part interest. Security chain lock. 3,944,268, Cl. 292-264.000.
Goodyear Tire & Rubber Company, The: *See—*
Lawrence, John P., 3,944,552.
Gordon, Alexander L., to Federal-Mogul Corporation. Gasket with heat insulating properties. 3,944,235, Cl. 277-22.000.
Gordon, Dale: *See—*
Warner, William; and Gordon, Dale, 3,944,001.
Gotaverken Angteknik AB: *See—*
Astrom, Ingmar; and Janson, Stig, 3,943,861.
Goto, Koichi, to Kabushiki Kaisha Komatsu Seisakusho. Light detecting apparatus of improved resolution. 3,944,814, Cl. 250-209.000.
Goto, Masaaki: *See—*
Ishigami, Hideo; and Goto, Masaaki, 3,943,883.
Gottfried, Siegfried; and Baxendale, Lily, to Biorex Laboratories, Limited. Pharmaceutical composition. 3,944,660, Cl. 424-44.000.
Gottschalk, Karl-Heinz: *See—*
Schraud, Alfred; and Gottschalk, Karl-Heinz, 3,943,613.
Gould, Charna: *See—*
Gould, William; and Gould, Charna, 3,943,593.
Gould, Robert A., to United States of America, Navy. Rollonet assembly. 3,944,117, Cl. 222-95.000.
Gould, William; and Gould, Charna. Disposable rotory brush core for power sweeper. 3,943,593, Cl. 15-179.000.
Goulds, Anthony John; and Balint, Andrew, to Gunson's Sortex (Mineral and Automation) Limited. Apparatus for sorting objects by conductivity or resistivity. 3,944,076, Cl. 209-73.000.
Goursau, Daniel R., to Raymond Lee Organization, Inc., The, a part interest. Guitar neck. 3,943,816, Cl. 84-293.000.
Grachev, Andrei Nikolaevich: *See—*
Broide, Pinkhus Ruvimovich; Surkov, Igor Konstantinovich; and Grachev, Andrei Nikolaevich, 3,943,664.
Graco Inc.: *See—*
Siczek, Bernard, 3,944,141.
Grafwallner, Franz; and Schutz, Manfred, to Messerschmitt-Bolkow-Blohm GmbH. Ignition system for rocket engine combustion chambers operated by non-hypergolic propellant components. 3,943,706, Cl. 60-204.000.
Grard, Charles: *See—*
Chabardes, Pierre; Grard, Charles; and Schneider, Charles, 3,944,623.
Grau, Hermann. Safety screw closure. 3,944,102, Cl. 215-251.000.
Graves, Vernon James: *See—*
Watson, William Bruce; and Graves, Vernon James, 3,944,104.
Gray, Alan Lyle, to Applied Research Laboratories Limited. Methods and apparatus for analyzing mixtures. 3,944,826, Cl. 250-288.000.
Graybill, Wilbur H. Conveyor system and method for assuring a continual backlog. 3,944,049, Cl. 198-34.000.
Greaney, Daniel F. Baseball bat batting practice sleeve. 3,944,225, Cl. 273-26.00B.
Greatbatch, Wilson: *See—*
Mead, Ralph T.; Greatbatch, Wilson; and Rudolph, Frank W., 3,944,433.
Green, Charles J., to Damon Corporation. Two stage rocket with pressure responsive means for frictionally engaging second stage. 3,943,656, Cl. 46-74.00C.
Green, Chester, to Hanscom, Genevieve I.; and Genevieve I. Hanscom, Robert Magnuson, Lois J. Thomson, trustees of the estate of Roy M. Magnuson, part interest to each. Shuffle feed sizing mechanism. 3,944,077, Cl. 209-73.000.
Green, Dale J.: *See—*
McCarter, Michael K.; and Green, Dale J., 3,944,996.
Green, Sam J.; and Raeske, Frank J., to Champion Spark Plug Company. Electronic control of spark advance and dwell. 3,943,896, Cl. 123-117.00R.
Greenberg, Michael P.: *See—*
Morley, Richard E.; and Greenberg, Michael P., 3,944,984.
Greene, Leonard M., to Safe Flight Instrument Corporation. Sailboat steering indicator system. 3,943,764, Cl. 73-178.00R.
Greene, Ronald W.; Fagan, Edmund I.; and Keeler, Jack D., to EMF Corporation. Tower type sorting and collating apparatus. 3,944,217, Cl. 271-173.000.
Greenwald, Harold L.; and Kine, Benjamin B., to Rohm and Haas Company. Purification of polymer dispersions with adsorbent carbon particles. 3,944,513, Cl. 260-29.6PT.
Greenwood, Richard H., to Aeronutronic Ford Corporation. Cabinet support structure. 3,944,178, Cl. 248-226.00D.
Gremillet, Jean. Syllabic typewriters and similar machines. 3,944,042, Cl. 197-7.000.
Gremillet, Jean. Shift mechanism in syllabic typewriters. 3,944,043, Cl. 197-72.000.
Grenfell, James W.; Sorenson, Fred M.; Ueno, Hiroshi; and Miyahara, Masato. Remote-recording periodontal depth probe. 3,943,914, Cl. 128-2.00S.
Grenfell, James W.: *See—*
Ueno, Hiroshi; Grenfell, James W.; Sorenson, Fred M.; and Hozumi, Kazuo, 3,943,629.
Gresham, John T., to FMC Corporation. Phosphate esters. 3,944,633, Cl. 260-927.00R.
Greven, Johann: *See—*
Wetzels, Walter; Greven, Johann; Romer, Wilhelm; and Hoppe, Heinz, 3,943,743.
Grimm, Hugo: *See—*
Dorr, Karl-Heinz; Grimm, Hugo; Sander, Ulrich; Peichl, Robert; and Tacke, Michael, 3,944,401.
Grindle, James L., to General Electric Company. Luminare. 3,944,810, Cl. 240-103.00R.
Grishaev, Gennady Ivanovich; and Tsygankin, Nikolai Ivanovich. Mechanism for loading lamp caps into the cells of an endless chain conveyor. 3,944,048, Cl. 198-25.000.
Groppel, Dieter; and Siemsen, Gisela, to Siemens Aktiengesellschaft. Hybrid electrode for metal/air cells. 3,944,434, Cl. 136-86.00A.
Gross, Arthur: *See—*
Bhaskar, Surindar N.; Selting, Wayne J.; Gilmore, Eleanor L.; and Gross, Arthur, 3,943,592.
Gross, Otto: *See—*
Parker, Bernard; Gross, Otto; and Buchler, Joseph, 3,944,188.
Grundy, David Latham; and Hughes, Kenneth Lawson, to Ferranti Limited. Semiconductor integrated circuit device having a conductive plane and a diffused network of conductive tracks. 3,945,032, Cl. 357-40.000.
Gspann, Jurgen, to Gesellschaft fur Kernforschung mbH. Method of physical separation of components of a molecular beam. 3,944,399, Cl. 55-17.000.

GTE Sylvania Incorporated: *See—*
Arumugham, Rangaswamy; Kruszewski, William Frank; and Siwko, Karol, 3,944,725.
Brenan, Robert R.; and Johnson, Gordon L., 3,943,625.
Cleveland, Joseph J., 3,943,994.
Reed, Frederick Frank, 3,944,943.
Gueguen, Michel. Satellite tracking antenna having a dish moveably supported at three points. 3,945,015, Cl. 343-765.000.
Guilbault, Lawrence James; and Hoffstadt, Frederick Alan, to Calgon Corporation. Low fluid loss cementing compositions. 3,943,996, Cl. 166-293.000.
Guinosso, Charles J.: *See—*
Teller, Daniel M.; Sellstedt, John H.; and Guinosso, Charles J., 3,944,580.
Gulf Research & Development Company: *See—*
Mitchell, Bruce R.; and Swift, Harold E., 3,944,482.
Gulf & Western Industries, Inc.: *See—*
Hill, Frank W.; and Hedman, Theodore A., 3,944,906.
Gunnerman, Rudy W., to Plastonium, Inc. Preparation of heat barrier materials. 3,944,685, Cl. 427-223.000.
Gunson's Sortex (Mineral and Automation) Limited: *See—*
Goulds, Anthony John; and Balint, Andrew, 3,944,076.
Gutierrez, Eddie N.; and Reardon, Robert C., Jr., to Lever Brothers Company. Process for the preparation of selectively halogenated ketals. 3,944,568, Cl. 260-340.900.
Gvozdetsky, Vasily Stepanovich: *See—*
Paton, Boris Evgenievish; Dudko, Daniil Andreevich; Gvozdetsky, Vasily Stepanovich; Asoyants, Grigory Bagradovich; Sklyarevsky, Vladik Efimovich; Skrypnik, Valentin Ivanovich; and Shmakov, Eduard Ivanovich, 3,944,780.
H. Maihak AG: *See—*
Holst, Johann; and Rusbuldt, Horst, 3,943,768.
Habock, Adolf: *See—*
Beckmann, Oskar; Habock, Adolf; and Leowald, Karl-Friedrich, 3,944,815.
Hacker, Joseph Michael; Kaufman, Stanley; Sabia, Raffaele Antonio; Sauer, Earl Salvator; Tidd, Charles Edward, Jr.; and Walker, Raymond, to Western Electric Company, Inc.; and Bell Telephone Laboratories, Inc. Flame-retardant, water-resistant composition and coating transmission member therewith. 3,944,717, Cl. 174-23.00C.
Hadermann, Albert F.; Waters, Paul F.; and Woo, Jung Woo. Electroosmotic kilovoltmeter. 3,944,918, Cl. 324-94.000.
Hafla, Dietmar, to Index-Werke KG Hahn & Tesky. Mounting arrangement for a spindle. 3,943,803, Cl. 82-30.000.
Haggerty, John S.; Menashi, Wilson P.; and Wenckus, Joseph F., to Arthur D. Little, Inc. Method for forming refractory fibers by laser energy. 3,944,640, Cl. 264-25.000.
Hagglund, Erik Olof Sture: *See—*
Samuelson, Hans Olof; Smedman, Leif Ake; and Hagglund, Erik Olof Sture, 3,944,463.
Hagiwara Denki Kabushiki Kaisha: *See—*
Hattori, Shuzo; and Hiramatsu, Tadao, 3,944,812.
Hahn, Werner; Schulze, Heinz; and Walther, Bernhard, to Veb Pentacon Dresden. Film cassette. 3,944,154, Cl. 242-71.200.
Hai, Harry Wong Hon, to Winner Food Products Limited. Intensive cultivation. 3,943,658, Cl. 47-1.200.
Hakanson, Nils L.; and Touchette, Albert F., to Scott Paper Company. Copyboard cover for a photographic copying machine. 3,944,367, Cl. 355-76.000.
Halbach and Braun: *See—*
Braun, Ernst; and Braun, Gert, 3,944,061.
Halpern, Ernest H.: *See—*
Wolf, Alfred A.; and Halpern, Ernest H., 3,944,578.
HAMEL Projektierungs- und Verwaltungs-AG.: *See—*
Kunz, Albert; and Kullmann, Helmut, 3,943,689.
Hampson, James W.: *See—*
Luddy, Francis E.; Hampson, James W.; Herb, Samuel F.; and Rothbart, Herbert L., 3,944,585.
Hamy, Norbert, to Tebron Holdings Ltd. Variable speed transport system. 3,944,044, Cl. 198-16.0MS.
Hancor, Inc.: *See—*
Schmunk, John D., 3,943,971.
Handa, Makoto; and Hayashi, Hiromichi, to Snow Brand Milk Products Co., Limited. Powder material sampling device. 3,943,771, Cl. 73-424.000.
Hanka, Ladislav J.: *See—*
Martin, David G.; and Hanka, Ladislav J., 3,944,562.
Hanke, Albert Robert, to Du Pont de Nemours, E. I., and Company. Preparation of β-copper phthalocyanine without milling. 3,944,564, Cl. 260-314.500.
Hanna, Daniel C. Rocker panel brush mechanism. 3,943,590, Cl. 15-21.00D.
Hannes, Karl: *See—*
Einhorn, Ruediger; Chasen, Lee Richard; and Hannes, Karl, 3,944,186.
Hans Kolb KG: *See—*
Tibbe, Gunter, 3,944,164.
Hanscom, Genevieve I.: *See—*
Green, Chester, 3,944,077.
Hansen, Harland W., to Shaw-Walker Company, The. Hanging file folder support structure. 3,944,080, Cl. 211-46.000.
Hanser, Paul Edmond, to HWH Corporation. Apparatus for treating particulate material. 3,943,637, Cl. 34-56.000.
Hara, Kunio, to Nifco Inc. Plastic binder. 3,943,607, Cl. 24-16.0PB.
Harada, Isamu: *See—*
Tsunoda, Ichiro; Takeuchi, Satoshi; Hirao, Yoichiro; Suzuki, Takeo; Nishiue, Yoshihiro; Tadokoro, Katsumasa; Fukagawa, Toshimasa; Harada, Isamu; Misawa, Akira; and Watanabe, Kazuo, 3,944,330.
Harada, Nozomu, to Tokyo Shibaura Electric Co., Ltd. Charge transfer apparatus having light sensitivity control means. 3,944,816, Cl. 250-211.00J.
Harada, Shuichi: *See—*
Miya, Masami; Nagasaki, Masao; and Harada, Shuichi, 3,943,578.
Haraikawa, Tetsuo, to Tokico Ltd. Disc brake and actuator assembly structure. 3,944,028, Cl. 188-72.500.
Harao, Norio; Obata, Yoshiharu; and Yamaguchi, Tatsuo, to Tokyo Shibaura Electric Co, Ltd. Cathode ray tube device of preheated type. 3,944,880, Cl. 315-380.000.
Harding, James, to Union Carbide Corporation. Fibrous batts impregnated with aqueous dispersions based on heat-hardenable phenolic resins. 3,944,703, Cl. 428-288.000.
Hardy, Francis R. F.: *See—*
King, Ian Robert; and Hardy, Francis R. F., 3,944,572.
Hargreaves, Keith: *See—*
Bradley, Geoffrey; Hargreaves, Keith; and Wainwright, Paul, 3,944,521.
Harnischfeger Corporation: *See—*
Fritsch, Robert A., 3,944,082.
Harrelson, Lamont: *See—*
Geisow, Bernard H.; and Harrelson, Lamont, 3,943,846.
Harrington, Cecil F.; Johnson, James M.; and Prince, Howard T., to Procter and Gamble Company, The. Abrasive seed defiberization. 3,943,604, Cl. 19-43.000.
Harris, James Marian: *See—*
Brandstaetter, David Peter; and Harris, James Marian, 3,944,985.
Harris, Nick S.; and Feinstein, Robert, to Preventive Systems, Inc. In vitro process for detecting endotoxin in a biological fluid. 3,944,391, Cl. 23-230.00B.
Harris Preble Company: *See—*
Jecmen, James M.; and Jecmen, John J., 3,943,663.
Harris, Samuel C., Jr.; and Jones, Clifford M., to General Electric Company. Print rate control system. 3,944,741, Cl. 178-23.00R.
Harrison, Raymond J.: *See—*
Luke, John A.; and Harrison, Raymond J., 3,943,835.
Harshaw Chemical Company, The: *See—*
Burt, Gerald D.; and Mudrak, Anton, 3,944,540.
Hart, Bessie M.: *See—*
Hart, Francis; and Hart, Bessie M., 3,944,256.
Hart, Francis; and Hart, Bessie M. Fifth wheel dolly. 3,944,256, Cl. 280-402.000.
Hartig, Gunter. Method and device for igniting combustible substances. 3,943,905, Cl. 123-148.0CA.
Hartman, David K., to General Electric Company. Semiconductor device and method of manufacture therefor. 3,943,621, Cl. 29-578.000.
Hartmann, Franz, to Nordischer Maschinenbau Rud. Baader. Apparatus for aligning the tail parts of fish. 3,943,603, Cl. 17-53.000.
Hartmann, Karl. Transversely stiff conveyor belt. 3,944,060, Cl. 198-193.000.
Hase, Alfred M. Battery charging circuit. 3,944,904, Cl. 320-23.000.
Hasegawa, Goro; Nakamoto, Soichi; Watanabe, Yoshiaki; Taguchi, Tetsuya; and Yamada, Katuhiko, to Canon Kabushiki Kaisha. Camera in which the iris is set prior to the exposure time and adaptable to permit shutter time preselection. 3,945,024, Cl. 354-29.000.
Hashimoto, Shigeru, to Canon Kabushiki Kaisha. Lens barrel for a camera. 3,944,340, Cl. 350-255.000.
Hastings, Bernard Lyle; and Sprung, Arnold. Modified snow ski. 3,944,239, Cl. 280-11.13E.
Hasunuma, Kyotaro; Kurokawa, Masahiro; and Abe, Takashi, to Kanebo Ltd. Vitamin E orotate and a method of producing the same. 3,944,550, Cl. 260-260.000.
Hata, Toshio. Constant torque ball joint. 3,944,376, Cl. 403-132.000.
Hattori, Shuzo; and Hiramatsu, Tadao, to Hagiwara Denki Kabushiki Kaisha. Electrooptic thin-film modulator. 3,944,812, Cl. 250-201.000.
Hauni-Werke Korber & Co. KG: *See—*
Stoffers, Helmut; George, Rudolf; Niemann, Helmut; and Rudszinat, Willy, 3,943,944.
Hauser, Raimund: *See—*
Freudenschuss, Otto, 3,944,348.
Hautala, Earl: *See—*
Randall, John M.; Hautala, Earl; Waiss, Anthony C., Jr.; and Kuhnle, Judith A., 3,944,415.
Hayakawa, Takumi: *See—*
Ikari, Shinichi; Hayakawa, Takumi; Kamikawa, Yozo; and Imai, Fumito, 3,944,431.
Hayami, Tadao, to Kabushiki Kaisha Koparu. Focal plane shutter. 3,945,026, Cl. 354-147.000.
Hayashi, Hiromichi: *See—*
Handa, Makoto; and Hayashi, Hiromichi, 3,943,771.
Hayashi, Yoshihiro; and Matsui, Kenji, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Seat belt retractor. 3,944,163, Cl. 242-107.40R.
Hayashi, Yoshimasa: *See—*
Nagumo, Shin-ichi; Nakajima, Yasuo; Hayashi, Yoshimasa; and Sugihara, Kunihiko, 3,943,711.
Hayden, Rodney, to TRW Inc. Vehicle window heater control device. 3,944,893, Cl. 317-148.50R.
Hayes, Michael Richard, to British Nuclear Fuels Ltd. Conveyor systems. 3,944,053, Cl. 198-64.000.
Hayne, Thomas F., to Xerox Corporation. Charging apparatus. 3,944,356, Cl. 355-3.00R.

Hayner, Paul F., to Sanders Associates, Inc. Flow control valve with internal rate of flow feedback. 3,943,957, Cl. 137-85.000.

Hayskar, Robert A., to Xerox Corporation. Bookbinder with a damped-adhesive strip inserter. 3,944,121, Cl. 226-136.000.

Hayssen Manufacturing Company: *See—*
Kovacs, Lloyd; and Cherney, Dale Mark, 3,943,683.

Head, Billy Duane: *See—*
Wing, Milton Silas; and Head, Billy Duane, 3,944,481.

Heberlein Maschinenfabrik AG.: *See—*
Raschle, Josef, 3,943,693.

Hedberg, Frederick L.; and Arnold, Fred E., to United States of America, Air Force. 2,2'-Bis(phenylethynyl-5,5'-diaminobenzidine. 3,944,614, Cl. 260-578.000.

Hedman, Theodore A.: *See—*
Hill, Frank W.; and Hedman, Theodore A., 3,944,906.

Hedrick, Ross Melvin; and Gabbert, James D., to Monsanto Company. Polyester initiated anionic catalyzed polymerization of lactam. 3,944,629, Cl. 260-857.0PE.

Heeren, Richard H., to Teletype Corporation. Voltage sensitive isolation for static logic circuit. 3,944,848, Cl. 307-205.000.

Hegewaldt, Fritz; Gillhaus, Horst; and Erdman, Otto, to Brown, Boveri & Cie Aktiengesellschaft. Induction crucible furnace. 3,944,715, Cl. 13-27.000.

Heinrich Worner Fabrik Fur Autoteile: *See—*
Ehrenberg, Kurt; and Worner, Klaus, 3,943,678.

Heisner, Donald N.; Palermo, Anthony, Jr.; and Loyer, Phillip K., to Picker Corporation. Tire inspection system with shielded X-ray source. 3,944,831, Cl. 250-358.00T.

Heissmann, Willi: *See—*
Brinkmann, Jurgen; Rasche, Manfred; and Heissmann, Willi, 3,944,432.

Heisterberg, Milton W., to General American Transportation Corporation. Floating roof. 3,944,113, Cl. 220-219.000.

Helmuth, James G., to Chadwick-Helmuth Company, Inc. Rapid starting of gas discharge lamps. 3,944,876, Cl. 315-205.000.

Henderson, Cyril, to American Safety Equipment Corporation. Reel for storing belts or the like. 3,944,162, Cl. 242-107.40A.

Hendrickson, Paul E., to Raymond Boyd Associates. Procedure for forming small wires. 3,943,619, Cl. 29-423.000.

Henley, Michael Lee; and Smith, Lawrence Edward, to RCA Corporation. Retrace pulse generator having improved noise immunity. 3,944,883, Cl. 315-399.000.

Hepworth, Stephen John: *See—*
Burrows, Harold George; and Hepworth, Stephen John, 3,944,518.

Herb, Samuel F.: *See—*
Luddy, Francis E.; Hampson, James W.; Herb, Samuel F.; and Rothbart, Herbert L., 3,944,585.

Herd, Alan James: *See—*
Anderson, Robert Craig; and Herd, Alan James, 3,943,942.

Hering, Frederic S.; and Schwartz, Joseph I., to United States of America, Navy. Cargo/ballast separation by dual membrane system. 3,943,873, Cl. 114-125.000.

Hermanns, Peter, to FMN Schuster & Co. Process for compensating short-term fluctuations in thread tension during feeding of thread to winding machines and the like. 3,944,166, Cl. 242-147.00A.

Herrman, Arthur L. Suspension system. 3,944,248, Cl. 280-124.00B.

Hersberger, Pierre: *See—*
Portmann, Hubert; Saurer, Eric; and Hersberger, Pierre, 3,943,696.

Hershman, Arnold; and Forster, Denis, to Monsanto Company. Production of propionic acid. 3,944,604, Cl. 260-533.00A.

Herzog, William Frederic, to Ampex Corporation. Frequency modulator. 3,944,949, Cl. 332-14.000.

Hess, Howard V.; Cole, Edward L.; and Franz, William F., to Texaco Inc. Coking of waste kraft pulping liquors at lowered pH. 3,944,462, Cl. 162-31.000.

Hexel, Gunter, to Schmalbach-Lubeca-werke AG. Plastic containers. 3,944,124, Cl. 229-1.50B.

Heymanns, Willi, to Jagenberg-Werke AG. Rewinding machine for longitudinally slit webs of paper. 3,944,152, Cl. 242-65.000.

Hicks, Raymond John, to Vickers Limited. Gears. 3,943,787, Cl. 74-410.000.

Hiemstra, John R.; and Wagner, Wayne M., to Donaldson Company, Inc. Exhaust system connector seal. 3,944,265, Cl. 285-419.000.

Hiestand, Willem Pieter: *See—*
van Calsteren, Francois Adriaan; and Hiestand, Willem Pieter, 3,944,405.

Higaki, Taiji: *See—*
Fujioka, Hironari; Matsushita, Takao; and Higaki, Taiji, 3,944,705.

Higgins, David M., to Comptex, Inc. Device for centering a load in a bagging machine. 3,944,045, Cl. 198-19.000.

Higo, Nobumasa: *See—*
Arai, Hiroshi; Watanabe, Yohei; Ohta, Jun; Higo, Nobumasa; and Sakurai, Yasuhiko, 3,944,969.

Hild, Henry F.; and Stearley, John W., to Robertshaw Controls Company. Electrical terminal means. 3,944,315, Cl. 339-95.00R.

Hildebrand, George, to American Kennel Club. Measuring wicket for height of dogs. 3,943,630, Cl. 33-169.00R.

Hill, Bernhard: *See—*
Krumme, Jens-Peter; and Hill, Bernhard, 3,944,992.

Hill, Frank W.; and Hedman, Theodore A., to Gulf & Western Industries, Inc. Detector device for converting A.C. inputs to an D.C. output and a system for using the same. 3,944,906, Cl. 321-8.00R.

Hills, Richard, to Borg-Warner Limited. Hydraulic governors. 3,943,956, Cl. 137-56.000.

Hillyer, Anthony William, to Raleigh Industries Limited. Gear change mechanism. 3,943,796, Cl. 74-577.00S.

Hilsum, Cyril; Johnson, Frederick Alistair; and Raynes, Edward Peter, to National Research Development Corporation. Optical intensity adjustment devices. 3,944,817, Cl. 250-213.0VT.

Hilti Aktiengesellschaft: *See—*
Maier, Elmar; and Tilg, Robert, 3,944,068.

Hiraga, Ryozo: *See—*
Tsuda, Shin; and Hiraga, Ryozo, 3,944,921.

Hiramatsu, Tadao: *See—*
Hattori, Shuzo; and Hiramatsu, Tadao, 3,944,812.

Hirao, Yoichiro: *See—*
Tsunoda, Ichiro; Takeuchi, Satoshi; Hirao, Yoichiro; Suzuki, Takeo; Nishiue, Yoshihiro; Tadokoro, Katsumasa; Fukagawa, Toshimasa; Harada, Isamu; Misawa, Akira; and Watanabe, Kazuo, 3,944,330.

Hirashima, Kenzo; and Fujiwara, Yasuhiko, to Nissan Motor Company Limited. Inertia sensor switch. 3,944,764, Cl. 200-61.45M.

Hirose, Ryusho: *See—*
Tajima, Akira; Hirose, Ryusho; Hosoe, Kazuya; Furukawa, Hiroshi; and Ichiyanagi, Toshikazu, 3,944,324.

Hirose, Tadatsugu: *See—*
Owaki, Kenichi; Urade, Toshinori; and Hirose, Tadatsugu, 3,944,875.

Hirose, Yutaka; and Isomura, Sadao, to Toyo Kogyo Co., Ltd. Intake system for an internal combustion engine. 3,943,906, Cl. 123-179.00G.

Hirota, Ryuichi; Kakuta, Hisashi; Motoba, Shigetado; Shimizu, Kenichi; Kanno, Ryoichi; and Narita, Mitsuaki, to Asahi Glass Company Ltd.; and Mitsubishi Kakoki Kaisha Ltd. Process for removing oxides of sulfur, dust and mist from combustion waste gas. 3,944,650, Cl. 423-242.000.

Hirsh, Ivan Yehudi: *See—*
Doerman, Eryk Stefan; and Hirsh, Ivan Yehudi, 3,943,752.

Hitachi, Ltd.: *See—*
Horie, Taturo, 3,944,856.
Ishigami, Hideo; and Goto, Masaaki, 3,943,883.
Kajiwara, Toshiyuki; and Sonobe, Noriyoshi, 3,943,742.
Kishi, Tuneo; and Nakano, Seizo, 3,943,777.
Tanihara, Yozo; and Niimi, Masayasu, 3,945,033.
Umino, Tomio; Suzuki, Munenobu; and Shida, Tomohiko, 3,944,779.
Usami, Noboru; Sodeyama, Chuichi; and Shoyama, Hirozi, 3,944,931.
Yasumoto, Seiichi; Kobayashi, Kazuhiko; Yasuda, Isao; and Itoh, Ken, 3,944,975.

Hitachi Seiko Ltd.: *See—*
Mizuhara, Yasushi; Abe, Tsuwao; and Hitomi, Hiroyuki, 3,944,475.

Hitco: *See—*
Rheaume, Walter A., 3,943,980.

Hitomi, Hiroyuki: *See—*
Mizuhara, Yasushi; Abe, Tsuwao; and Hitomi, Hiroyuki, 3,944,475.

Hively, Lee Mizener, to Western Electric Co., Inc. Method and apparatus for ultrasonically measuring deviation from straightness, or wall curvature or axial curvature, of an elongated member. 3,944,963, Cl. 340-1.00R.

Hochstrasser, Ulrich P.: *See—*
Becker, Joseph J.; Hochstrasser, Ulrich P.; and Skorianetz, Werner, 3,944,620.

Hoechst Aktiengesellschaft: *See—*
Broecker, Bernhard; Schardt, Richard; and Werner, Gerhard, 3,944,512.
Lind, Erwin, 3,944,417.

Hoenigmann, Gustave, to Acme Steel Door Corporation. Automatic weld grinding machine. 3,943,667, Cl. 51-112.000.

Hofer, Peter, to ETA A.G. Ebauches-Fabrik. Divers' fluid-tight watch comprising an electric circuit. 3,943,694, Cl. 58-19.00C.

Hoffman-La Roche Inc.: *See—*
Westley, John, 3,944,573.

Hoffmann-La Roche Inc.: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,944,531.

Hoffstadt, Frederick Alan: *See—*
Guilbault, Lawrence James; and Hoffstadt, Frederick Alan, 3,943,996.

Hogan, Thomas E., to International Automated Machines, Inc. Shipping and dispensing container. 3,944,128, Cl. 229-17.00B.

Hogg, Walter R.; Liedholz, Gerhard A.; and Coulter, Wallace H., to Coulter Electronics, Inc. Electrical sensing circuitry for particle analyzing device. 3,944,917, Cl. 324-71.0CP.

Hogg, Walter R.: *See—*
Coulter, Wallace H.; and Hogg, Walter R., 3,944,797.

Hokuriku Kakoki Kabushiki Kaisha: *See—*
Morisaki, Kazuo; and Watanabe, Mikio, 3,944,687.

Holec N.V.: *See—*
Brinkman, Willem, 3,943,892.

Hollenbach, Georg: *See—*
Barth, Hans-Jochen; Reinecke, Herbert; Hollenbach, Georg; and Kurz, Eduard, 3,944,508.

Hollinger, Richard G. Top stack feeder. 3,944,216, Cl. 271-157.000.

Holmes, Thomas G.; and Seib, Kenneth L., to Optical Business Machines. Adaptive and programmed threshold level detection arrangement. 3,944,977, Cl. 340-146.3AG.

Holmgren, Marvin E.: *See—*
Chudgar, Anil H.; Fischer, Richard L.; and Holmgren, Marvin E., 3,944,453.

Holst, Johann; and Rusbuldt, Horst, to H. Maihak AG. Method and apparatus for measuring peak pressure in fluids. 3,943,768, Cl. 73-396.000.

Holt, Eugene L., to Exxon Research & Engineering Co. Substoichiometric air addition to first stage of dual catalyst system. 3,943,709, Cl. 60-274.000.

Holt, James W.; and Meeks, John K., to Crane Co. Cartridge faucet. 3,943,967, Cl. 137-454.500.

Holtsch, Peter. E. Device for recording on and storage of information cards. 3,943,647, Cl. 40-73.400.

Holz, Heinz, to FKF Berlin Fleischwaren und Konservenfabrik, Schulz & Berndt GmbH & Co. KG. Combination serving tray with removable insert for serving means. 3,944,109, Cl. 220-20.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Katagiri, Nagatoshi, 3,944,009.

Honda, Hisashi, to Nippon Electric Company, Limited. Variable resistance attenuator. 3,944,962, Cl. 338-126.000.

Honeywell Inc.: *See—*
Simon, Frank N., 3,943,753.
Stauffer, Norman L., 3,945,023.

Honeywell Information Systems Italia: *See—*
Pellicano, Emilio, 3,944,122.

Honjo, Satoru: *See—*
Miyatsuka, Hajime; Honjo, Satoru; Sawada, Kenichi; and Saida, Takashi, 3,944,682.

Honna, Kosaku; Shimizu, Nobuaki; and Kurisaki, Konomu. Process for producing adamantane compounds. 3,944,626, Cl. 260-666.00M.

Hooker Chemicals & Plastics Corporation: *See—*
Ruthel, Walter W.; and Evans, Leo G., 3,944,479.

Hoover, Merle Vincent, to RCA Corporation. Bridge-balance detection circuit. 3,944,859, Cl. 307-308.000.

Hoppe, Heinz: *See—*
Wetzels, Walter; Greven, Johann; Romer, Wilhelm; and Hoppe, Heinz, 3,943,743.

Horie, Taturo, to Hitachi, Ltd. Chopper control system. 3,944,856, Cl. 307-240.000.

Horizons Incorporated, a division of Horizons Research Incorporated: *See—*
Lewis, James M.; and Newyear, Raymond W., 3,944,421.

Horodysky, Andrew G.; and Allen, Paul T., to Mobil Oil Corporation. Preparation of sulfurized olefins. 3,944,539, Cl. 260-139.000.

Hortin, Kenneth L.: *See—*
Nonomaque, Clyde Joseph; Tillman, Harry Lucian; and Hortin, Kenneth L., 3,944,111.

Hosaka, Hideo, to Max Kabushiki Kaisha. Pollinator. 3,943,660, Cl. 47-1.410.

Hosoda, Naoyuki: *See—*
Yanagida, Tokio; Saito, Ariyoshi; Hosoda, Naoyuki; and Kaneko, Fukuzo, 3,944,414.

Hosoe, Kazuya: *See—*
Tajima, Akira; Hirose, Ryusho; Hosoe, Kazuya; Furukawa, Hiroshi; and Ichiyanagi, Toshikazu, 3,944,324.

Hostettler, Hans; Abel, Heinz; and Topfl, Rosemarie, to Ciba-Geigy Corporation. Process for rendering wool non-felting. 3,944,385, Cl. 8-128.00A.

Hough, Wayne E.: *See—*
Dalke, James A.; and Hough, Wayne E., 3,944,993.

Houghtaling, John J. Consumable card activated apparatus. 3,944,039, Cl. 194-4.00R.

Houghton, Leonard Eric; and Hutchinson, John, to Imperial Chemical Industries Limited. Fluorocarbon derivatives of pyridine. 3,944,558, Cl. 260-297.00R.

Houlihan, William J.; and Nadelson, Jeffrey, to Sandoz, Inc. 3,3-Disubstituted phthalides. 3,944,570, Cl. 260-343.400.

Hounsfield, Godfrey Newbold, to E M I Limited. Apparatus for examining a body by radiation such as X or gamma radiation. 3,944,833, Cl. 250-367.000.

Howell, Roy M. Barrel type internal combustion engine. 3,943,895, Cl. 123-58.0AA.

Hozumi, Kazuo: *See—*
Ueno, Hiroshi; Grenfell, James W.; Sorenson, Fred M.; and Hozumi, Kazuo, 3,943,629.

Hramchenko, Jack; and Sibley, Murray J., to Barnes-Hind Pharmaceuticals, Inc. Abradant skin cleanser containing a borate salt. 3,944,506, Cl. 252-526.000.

Huang, Min-Nang, to DEC International, Inc. Conditioning the air of a smokehouse or the like. 3,943,841, Cl. 99-470.000.

Hubert, Armand: *See—*
Piret, Pierre; Fraikin, Hubert; and Hubert, Armand, 3,944,836.

Hughes, Kenneth Lawson: *See—*
Grundy, David Latham; and Hughes, Kenneth Lawson, 3,945,032.

Huie, Edwin C. Small building heating system. 3,944,136, Cl. 237-55.000.

Hummel, Herbert; and Schulz, Hansrichard, to Jauch, Erhard. Large-sized clockwork with an electrically driven striking train. 3,943,700, Cl. 58-38.00A.

Humphrey, William E., to Optical Research and Development Corporation. Semi-liquid stabilized optices. 3,944,325, Cl. 350-16.000.

Hunt, Harold R., to Phillips Petroleum Company. Carbon black reactor. 3,944,392, Cl. 23-259.500.

Huntley, James R. Workpiece clamping and positioning apparatus. 3,944,200, Cl. 269-42.000.

Hursen, Thomas F.; Kolenik, Steven A.; and Purdy, David L., to Arco Medical Products Company. Generation of electrical power. 3,944,438, Cl. 136-202.000.

Hutchinson, John: *See—*
Houghton, Leonard Eric; and Hutchinson, John, 3,944,558.

Hutner, Mark A.: *See—*
Petterec, Robert E.; and Hutner, Mark A., 3,944,784.

HWH Corporation: *See—*
Hanser, Paul Edmond, 3,943,637.

Hydrocarbon Research, Inc.: *See—*
Volk, William, 3,944,413.

Hydromatic GmbH: *See—*
Wagenseil, Ludwig, 3,943,828.

HydroTech International, Inc.: *See—*
Arnold, James F., 3,944,263.

I-T-E Imperial Corporation: *See—*
Clark, William R., 3,944,888.
Katzbeck, John W.; and Cron, James C., 3,944,716.

Ibe, Nobukuni: *See—*
Sato, Wasuke; Iriko, Fumio; Yuzawa, Yoshihiko; Takeuchi, Setsuyuki; and Ibe, Nobukuni, 3,944,643.

Ichii, Takao: *See—*
Yoshikawa, Shinsuke; Sasaki, Tohru; and Ichii, Takao, 3,943,614.

Ichimura, Takeo; and Kaneko, Teruo, to Nippon Kogaku K.K. Glass body having a fluorescent pattern inwardly of a surface thereof. 3,944,697, Cl. 428-210.000.

Ichiyanagi, Toshikazu: *See—*
Tajima, Akira; Hirose, Ryusho; Hosoe, Kazuya; Furukawa, Hiroshi; and Ichiyanagi, Toshikazu, 3,944,324.

Ickes, Gustav. Modular building wall unit and method for making such unit. 3,943,676, Cl. 52-309.000.

Ide, Fumio; Kishida, Kazuo; Deguchi, Seiji; and Kaneda, Masahiro, to Mitsubishi Rayon Co., Ltd. Process for preparing an impact resistant thermoplastic graft copolymer composition. 3,944,630, Cl. 260-879.000.

Idelson, Elbert M.: *See—*
Bloom, Stanley M.; Idelson, Elbert M.; Simon, Myron S.; and Waller, David P., 3,944,569.

Idemoto, Tom Y.: *See—*
Dion, C. Norman; and Idemoto, Tom Y., 3,943,666.

Ikari, Shinichi; Hayakawa, Takumi; Kamikawa, Yozo; and Imai, Fumito, to Keishin Matsumoto. Plate grid in use for a plate for a lead storage battery. 3,944,431, Cl. 136-36.000.

Illinois Tool Works Inc.: *See—*
Danko, Arthur Joseph, 3,944,176.
Rayburn, Charles C., 3,943,685.

Imai, Fumito: *See—*
Ikari, Shinichi; Hayakawa, Takumi; Kamikawa, Yozo; and Imai, Fumito, 3,944,431.

Imai, Hiroyuki; and Kaharu, Rikuo, to Nippon Steel Corporation. Method and apparatus for forming by vibration a refractory lining of a container for a molten metal. 3,944,193, Cl. 266-1.00R.

Imai, Koichiro: *See—*
Yamaguchi, Takeshi; and Imai, Koichiro, 3,943,574.

Imao, Syoji: *See—*
Osajima, Yoshihiro; Imao, Syoji; Shinomiya, Tokuo; Mihara, Sirou; and Edamatsu, Michisuke, 3,944,639.

Imazu, Shinichi: *See—*
Katsushima, Atsuo; Imazu, Shinichi; Fukui, Shoshin; Iwatani, Akitoshi; and Akazawa, Tadashi, 3,944,587.

Imperial Chemical Industries Limited: *See—*
Anderson, Robert Craig; and Herd, Alan James, 3,943,942.
Burrows, Harold George; and Hepworth, Stephen John, 3,944,518.
Houghton, Leonard Eric; and Hutchinson, John, 3,944,558.
Mathews, Carl Fraser; Deverell, Christopher; Pears, Gordon Edmund Alfred; and Knowles, Peter George, 3,944,699.
Smith, Leslie Harold, 3,944,611.
Williams, Colin, 3,944,895.

Imperial-Eastman Corporation: *See—*
Chudgar, Anil H.; Fischer, Richard L.; and Holmgren, Marvin E., 3,944,453.

Inada, Kunio; and Yamaguchi, Morio, to Pilot Man-Nen-Kitsu Kabushiki Kaisha. Flat screen alignment device. 3,943,851, Cl. 101-127.100.

Incho, Harry Hobart: *See—*
Montgomery, Ronald Eugene; and Incho, Harry Hobart, 3,944,666.

Index-Werke KG Hahn & Tesky: *See—*
Hafla, Dietmar, 3,943,803.

Indian Head Inc.: *See—*
Strauss, Leopold, 3,944,058.

Inman, Charles Edward, to Pennwalt Corporation. Method for the manufacture of water-repellent, fire-resistant nonwoven fabrics. 3,944,688, Cl. 427-381.000.

Innes, Robert, to Ronald Trist Controls Limited. Float operated electrical switch assembly. 3,944,844, Cl. 307-116.000.

Inoue, Shigeru; and Kimura, Tetsuo, to Mitsui Toatsu Chemicals, Inc. Method of recovering unreacted ammonium carbamate in urea synthesis. 3,944,605, Cl. 260-555.00A.

Institut de Recherches de la Siderurgie Francaise: *See—*
Gatellier, Christian; and Olette, Michel, 3,944,476.

Institut Francais du Petrole: *See—*
Cholet, Jacques; Laurent, Jean; and Magneville, Pierre, 3,944,031.

Intel Corporation: *See—*
Chou, Sunlin, 3,944,990.

Inter-Lakes Engineering Co.: *See*—
Kasper, Cass S., 3,944,088.
Interatom, International Atomreaktorbau GmbH: *See*—
Biermann, Willi; Iversen, Klaus; and Lohe, Johannes, 3,944,467.
Interlake, Inc.: *See*—
Karr, George A., 3,944,460.
Lowe, Earl F., 3,944,472.
International Automated Machines, Inc.: *See*—
Hogan, Thomas E., 3,944,128.
International Business Machines Corporation: *See*—
Magdo, Ingrid E.; and Magdo, Steven, 3,944,447.
International Computers Limited: *See*—
Moore, John Richard, 3,944,999.
International Flavors & Fragrances Inc.: *See*—
Mookherjee, Braja Dulal; Kamath, Venkatesh; and Shuster, Edward J., 3,944,621.
International Harvester Company: *See*—
Mecklin, Charles D.; and Robinson, Edward L., Jr., 3,943,845.
Metcalfe, Arthur G.; and Rose, Fred K., 3,944,782.
International Nickel Company, Inc., The: *See*—
Donachie, Stephen James, 3,944,442.
International Paper Company: *See*—
Means, John A., 3,944,464.
International Telephone & Telegraph Corporation: *See*—
Moore, William Cooper; Kiss, John David; and Dean, John Richard, 3,944,809.
Intezet, Femipari Kutato: *See*—
Solymar, Karoly; Zambo, Janos; Orban nee Kelemen, Marika; Bujdoso, Erno; Feher, Ivan; Ozvald, Zoltan; Voros, Istvan; Ferenczi, Tibor; Toth, Pal; Lazar, Ferenc; Pinter, Tihamer; Sigmond, Gyorgy; Siklosi, Peter; Wentzely, Kalman; Lengyel, Laszlo; and Matyasi, Jozsef, 3,944,648.
Inui, Takao. Shock-absorbing device. 3,944,254, Cl. 280-276.000.
Inui, Toshiaki: *See*—
Teshima, Haruto; and Inui, Toshiaki, 3,943,813.
Ioanesian, Jury Rolenovich; and Kuzin, Boris Vladimirovich. Thrust support for a fluid motor used in drilling wells. 3,944,303, Cl. 308-6.00A.
Iomec, Inc.: *See*—
Johnson, Albin Kenneth, 3,945,037.
Ion Tech Limited: *See*—
Franks, Joseph; and Baghurst, Dennis John, 3,944,873.
Iqbal, Abul F. M., to Monsanto Company. Process for the production of aromatic primary amines. 3,944,615, Cl. 260-580.000.
Iriko, Fumio: *See*—
Sato, Wasuke; Iriko, Fumio; Yuzawa, Yoshihiko; Takeuchi, Setsuyuki; and Ibe, Nobukuni, 3,944,643.
Irsai, Eugene. Electric conductive laminated vessel wall. 3,943,769, Cl. 73-401.000.
IS Incorporated Systems Company: *See*—
Lindahl, Harold T.; and Maggos, Theodore, 3,943,673.
Iselin, Beat; and Sieber, Peter, to Ciba-Geigy Corporation. Process for the temporary protection of amino groups in peptide syntheses. 3,944,590, Cl. 260-463.000.
Ishibe, Shuhei; Okumichi, Toshiharu; and Matsumoto, Keizo, to Arkawa Rinsan Kagaku Kogyo Kabushiki Kaisha. Novel resins and manufacturing the same. 3,944,532, Cl. 260-89.300.
Ishida, Yotsuo; Okazaki, Takeo; Matsumura, Hajime; Menju, Shinichi; and Ohshima, Iwao, to Tokyo Electric Power Company, Ltd.; and Tokyo Shibaura Electric Company, Ltd. Protection apparatus for a capacitor connected in series with an electric power circuit. 3,944,886, Cl. 317-12.00A.
Ishigaki, Yukinobu, to Victor Company of Japan, Ltd. Record disc recording system with signal amplitude controlled by stylus arm position. 3,944,754, Cl. 179-100.40C.
Ishigami, Hideo; and Goto, Masaaki, to Hitachi, Ltd. UHF tuner channel indicating device. 3,943,883, Cl. 116-124.10R.
Ishigami, Noriakira; and Kobayashi, Hideyuki, to Aisin Seiki Kabushiki Kaisha. Hydraulic brake control assembly. 3,944,293, Cl. 303-24.00F.
Ishikawa, Yoshitaka, to Daika Kabushiki-Kaisha. Bed with a commode. 3,943,583, Cl. 5-90.000.
Isomura, Sadao: *See*—
Hirose, Yutaka; and Isomura, Sadao, 3,943,906.
Itagaki, Yasuhiko: *See*—
Sugita, Yasunori; and Itagaki, Yasuhiko, 3,944,530.
Itek Corporation: *See*—
Sullivan, John P., Jr., 3,944,427.
Ito, Hiroshi, to Sakai Chemical Industry Co. Ltd. Guide line tracer. 3,943,635, Cl. 33-264.000.
Ito, Osamu: *See*—
Akita, Shigeyuki; and Ito, Osamu, 3,944,981.
Ito, Shuji, to Mitsubishi Denki Kabushiki Kaisha; Dainippon Ink & Chemicals, Incorporated; and Murata, Yoshio. Apparatus for making printing masters. 3,944,726, Cl. 178-6.000.
Ito, Yuji; and Kato, Nori, to Canon Kabushiki Kaisha. Apparatus for superimposing a plurality of images. 3,944,351, Cl. 353-31.000.
Itoh, Ken: *See*—
Yasumoto, Seiichi; Kobayashi, Kazuhiko; Yasuda, Isao; and Itoh, Ken, 3,944,975.
Itoh, Takuji: *See*—
Suto, Munehisa; Itoh, Takuji; Tagaya, Nobuaki; and Obayashi, Takashi, 3,944,503.
Itoh, Yasuo: *See*—
Takahashi, Nobuaki; Kasuga, Masao; and Itoh, Yasuo, 3,944,755.
ITT Industries, Inc.: *See*—
Keller, Hans, 3,944,854.
Iversen, Klaus: *See*—
Biermann, Willi; Iversen, Klaus; and Lohe, Johannes, 3,944,467.
Iwata, Kohshi: *See*—
Nishiyama, Keizo; Yoshida, Yasushi; Yamazaki, Mutsumi; Iwata, Kohshi; and Tanaka, Yoshiaki, 3,944,514.
Iwatani, Akitoshi: *See*—
Katsushima, Atsuo; Imazu, Shinichi; Fukui, Shoshin; Iwatani, Akitoshi; and Akazawa, Tadashi, 3,944,587.
Izumi, Ryoji: *See*—
Okada, Akira; Izumi, Ryoji; Ninomiya, Syogo; Tahara, Yukio; Takehara, Yuji; Suezawa, Masaaki; and Kawasaki, Kazuhiro, 3,944,144.
Izumi, Yoichiro: *See*—
Sennari, Mutsuo; Izumi, Yoichiro; and Fujita, Taketoshi, 3,944,534.
J. Bobst & Fils SA: *See*—
Preisig, Roland, 3,943,681.
J. M. Feighery Company: *See*—
Feighery, James M.; and Lewallyn, Michael A., 3,943,864.
Jachna, Waclaw, to Centralny Osrodek Projektowo-Technologiczny Przemyslu Maszyn Gorniczych "ORTEM". Structural supports for heavy duty riddle assembly. 3,944,484, Cl. 209-409.000.
Jacobs, Harold; and Chrepta, Metro M., to United States of America, Army. Quasi-optical integrated circuits. 3,944,950, Cl. 333-31.00R.
Jacobs, Norman L. Soldering flux. 3,944,123, Cl. 228-223.000.
Jacobsson, Kurt Arne Gunnar; and Laursen, Ove, to Aktiebolaget IRO. Thread storage and supply device. 3,944,156, Cl. 242-47.120.
Jadwin, Thomas A.; and Storey, Robert C., to Eastman Kodak Company. Electrographic toner and developer composition. 3,944,493, Cl. 252-62.10P.
Jagenberg-Werke AG: *See*—
Heymanns, Willi, 3,944,152.
Jagenberg Werke Aktiengesellschaft: *See*—
Vetten, Wilhelm, 3,943,834.
Jagusch, Leonhard; Schonherr, Werner; and Weiske, Dieter, to VEB Chemieanlagenbau-und Montagekombinat. Centrifugal pump for pumping liquids with heavy gas content. 3,944,406, Cl. 55-407.000.
Jahnke, Harold N.: *See*—
Thiess, Harold C.; and Jahnke, Harold N., 3,944,444.
Jakobs, Willy: *See*—
Stockmann, Helmut; and Jakobs, Willy, 3,944,146.
Janes, George Sargent: *See*—
Levy, Richard H.; and Janes, George Sargent, 3,944,825.
Janke, Donald Edward, to Whirlpool Corporation. Two coil relay for dryer with integrated circuit control. 3,944,841, Cl. 307-38.000.
Jankowski, Raymond E.: *See*—
Bowers, Lewis H.; Jankowski, Raymond E.; and Sullivan, John L., 3,944,510.
Janning, John L., to NCR Corporation. Liquid crystal display device. 3,944,331, Cl. 350-160.0LC.
Jansa, Milos: *See*—
Kopal, Jaroslav; Jansa, Milos; and Deiss, Jaroslav, 3,943,732.
Janson, Stig: *See*—
Astrom, Ingmar; and Janson, Stig, 3,943,861.
Janssen, Peter Johannes Michiel; and Aarts, Petrus Josef Maria, to U.S. Philips Corporation. Circuit arrangement for maintaining the speed of a DC motor constant. 3,944,901, Cl. 318-318.000.
Japan Tobacco & Salt Public Corporation, The: *See*—
Takahara, Hiroyasu; Morishita, Isao; Shiga, Mikio; and Uchijima, Toshikatsu, 3,944,679.
Japanese National Railways: *See*—
Yasumoto, Seiichi; Kobayashi, Kazuhiko; Yasuda, Isao; and Itoh, Ken, 3,944,975.
Jarrett, Quentin T.: *See*—
Bigatel, Alfred I.; Jarrett, Quentin T.; Petskus, Ronald A.; Rowan, David C.; and Scheetz, Joseph M., 3,944,419.
Jauch, Erhard: *See*—
Hummel, Herbert; and Schulz, Hansrichard, 3,943,700.
Jean, Andre C.: *See*—
Ramont, Jacques P. A.; Jean, Andre C.; Puydebois, Leon M.; Rousse, Claude R.; and Massay, Michel, 3,943,856.
Jecmen, James M.; and Jecmen, John J., to Harris Preble Company. Astragal. 3,943,663, Cl. 49-370.000.
Jecmen, John J.: *See*—
Jecmen, James M.; and Jecmen, John J., 3,943,663.
Jenne, Richard L.; Marcoux, Leo; and Evans, Thomas E., to Texas Instruments Incorporated. Seat belt monitoring system and control device therefor. 3,944,970, Cl. 340-52.00E.
Jennerjahn, Brian M., to Phlpat, Inc. Apparatus and a method for slitting and winding elongated sheets of material into rolls. 3,944,150, Cl. 242-56.200.
Jensen, Niels P.; Kasdan, Harvey L.; and Thomasson, James T., to Recognition Systems, Inc. Electro-optical method and apparatus for making identifications. 3,944,978, Cl. 340-146.30E.
Jersey Nuclear-Avco Isotopes, Inc.: *See*—
Levy, Richard H.; and Janes, George Sargent, 3,944,825.
Pike, Charles T.; and Levy, Richard H., 3,944,947.
Jewell, James G.; Kelley, Fred W., Jr.; and Titus, Charles H., to General Electric Co. Direct current measuring system for rectifiers. 3,944,919, Cl. 324-107.000.
Jewitt, Cyril, to Reyrolle Parsons Limited. Homopolar dynamo-electric machines. 3,944,865, Cl. 310-178.000.
Jidosha Kiki Co., Ltd.: *See*—
Masuda, Naosuke; and Yanagawa, Itiro, 3,944,294.

Jinda, Takuma: *See*—
Tohyama, Shunroku; Jinda, Takuma; Saito, Shigemitsu; Tsuda, Yoshizo; and Shinohara, Satoshi, 3,944,522.
Jindra, Jaromir, to Elitex, Zavody textilniho strojirenstui, generalni reditalstui. Method of and apparatus for lateral tensioning of fabrics. 3,943,978, Cl. 139-292.000.
Joh. A. Benckiser GmbH: *See*—
Rieger, Manfred; and Kioustelidis, Johannes, 3,944,606.
Johansen, Ebbe, to Radiometer A/S. Method for collecting blood samples. 3,943,917, Cl. 128-2.00F.
Johansson, Benny: *See*—
Dahlqvist, Jan; Matsson, Bo; and Johansson, Benny, 3,944,730.
Johansson, Ingemar; and Reinertsen, Bjarne. Fishing device. 3,943,650, Cl. 43-15.000.
Johansson, Karl Nils Gunnar: *See*—
Folkers, Karl; Johansson, Karl Nils Gunnar; and Currie, Bruce L., 3,944,659.
Johansson, Paul-Johny. Dialysis apparatus for purifying fluid substances. 3,944,490, Cl. 210-321.00A.
John Z. DeLorean Corporation, The: *See*—
Dirks, Chauncey L., 3,944,704.
Johnson, Albin Kenneth, to Iomec, Inc. Feedback control system for linear position transducer. 3,945,037, Cl. 360-77.000.
Johnson, Ernst S. Work holder and catch pan. 3,944,199, Cl. 269-15.000.
Johnson, Frederick Alistair: *See*—
Hilsum, Cyril; Johnson, Frederick Alistair; and Raynes, Edward Peter, 3,944,817.
Johnson, Gordon L.: *See*—
Brenan, Robert R.; and Johnson, Gordon L., 3,943,625.
Johnson, Harold T. Golf club. 3,944,231, Cl. 273-162.00E.
Johnson, James M.: *See*—
Harrington, Cecil F.; Johnson, James M.; and Prince, Howard T., 3,943,604.
Johnson, James William, to Minnesota Mining and Manufacturing Company. Method to increase the visibility of game objects during telecasting. 3,944,738, Cl. 178-7.200.
Johnson & Johnson: *See*—
Ashton, William Howard; and Russell, Robert Schenke, 3,943,949.
Johnson, Richard A.; and Scott, Douglas E., to Norcon Electronic Laboratories, Inc. Small compact cathode ray oscilloscope assembly. 3,944,892, Cl. 317-120.000.
Johnson, Robert J. Apparatus and method for determining tooth mobility. 3,943,913, Cl. 128-2.00S.
Johnston Laboratories, Inc.: *See*—
Waters, John R., 3,944,471.
Jollie, Henry D., to Lawrence Pesak Associates, Inc., a part interest. Bicycle pedal. 3,943,797, Cl. 74-594.400.
Jones, Clifford M.: *See*—
Harris, Samuel C., Jr.; and Jones, Clifford M., 3,944,741.
Jones, Francis Lee. Ultra high temperature chemical reactions with metals. 3,944,443, Cl. 148-16.500.
Jones, James J., to Texas Instruments Incorporated. Skid control system. 3,944,289, Cl. 303-21.0BE.
Jones, John Paul, Jr., to Air Products and Chemicals, Inc. Electrolytic timer capsule with rupturable filament anode. 3,944,894, Cl. 317-232.000.
Jones, Neal K.; Langford, Aubrey F. W.; Anderson, Donald; and Crook, Walter R., to Commonwealth of Australia, The. Portable high intensity lamp. 3,944,806, Cl. 240-10.60R.
Jones, Peter Ronald Wright, to Multiscreen Corporation Limited; and Eclair Corporation of America. Shutter assembly. 3,944,349, Cl. 352-184.000.
Jones, Rodney V.: *See*—
Carothers, Paul A., 3,943,677.
Joseph Lucas (Industries) Limited: *See*—
Plant, Anthony Brian, 3,944,935.
Rohsler, Ivor Carl, 3,944,900.
Wright, Maurice James, 3,944,897.
Wright, Maurice James, 3,944,898.
Wright, Maurice James, 3,944,899.
Jost, Ernest M., to Texas Instruments Incorporated. Heater on metal composites. 3,944,787, Cl. 219-543.000.
Jovick, Raymond John, to Rockwell International Corporation. Hub cap speed sensor. 3,944,864, Cl. 310-168.000.
Jovill Manufacturing Company: *See*—
Sautner, William J., 3,944,792.
Jozuka, Masao, to Centronics Data Computer Corporation. Damper for printing and the like. 3,944,029, Cl. 188-282.000.
Jurovsky, Albert Yakovlevich. Device for transmitting the displacement of a pressure-responsive element situated in pressure space. 3,943,781, Cl. 74-18.100.
K-Tron Corporation: *See*—
Kane, Edward, 3,944,050.
Kabushiki Kaisha Jidoshokki Seisakusho: *See*—
Nishiyama, Keizo; Yoshida, Yasushi; Yamazaki, Mutsumi; Iwata, Kohshi; and Tanaka, Yoshiaki, 3,944,514.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Goto, Koichi, 3,944,814.
Kabushiki Kaisha Koparu: *See*—
Hayami, Tadao, 3,945,026.
Kabushiki Kaisha Morita Seisakusho: *See*—
Ueno, Hiroshi; Grenfell, James W.; Sorenson, Fred M.; and Hozumi, Kazuo, 3,943,629.
Kabushiki Kaisha Saginomiya Seisakusho: *See*—
Watanabe, Satoshi; and Sato, Koji, 3,945,017.
Kabushiki Kaisha Seikosha: *See*—
Ueno, Masaaki; and Ono, Takehiro, 3,945,019.
Kabushiki Kaisha Suwa Seikosha: *See*—
Fujita, Kinji, 3,943,697.
Ono, Yoshikazu, 3,943,698.
Shimakawa, George, 3,945,001.
Shimoi, Akio; Oguchi, Kikuo; and Ogata, Toshiaki, 3,944,862.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Hayashi, Yoshihiro; and Matsui, Kenji, 3,944,163.
Kawai, Yoshihiro; and Takemura, Atushi, 3,944,765.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Kato, Takayuki; and Yamazaki, Satoshi, 3,943,759.
Kaharu, Rikuo: *See*—
Imai, Hiroyuki; and Kaharu, Rikuo, 3,944,193.
Kahn, Leonard R. Compatible AM stereophonic receivers involving sideband separation at IF frequency. 3,944,749, Cl. 179-15.0BT.
Kahng, Dawon; and Ligenza, Joseph Raymond, to Bell Telephone Laboratories, Incorporated. Charge effects in doped silicon dioxide. 3,945,031, Cl. 357-23.000.
Kaibara, Nobuhiro: *See*—
Takahashi, Seiji; and Kaibara, Nobuhiro, 3,943,901.
Kajiwara, Toshiyuki; and Sonobe, Noriyoshi, to Hitachi, Ltd. Rolling mill. 3,943,742, Cl. 72-247.000.
Kakuta, Hisashi: *See*—
Hirota, Ryuichi; Kakuta, Hisashi; Motoba, Shigetado; Shimizu, Kenichi; Kanno, Ryoichi; and Narita, Mitsuaki, 3,944,650.
Kalinovski, Fred, to Robertshaw Controls Company. Condition responsive valve construction and method of making the same. 3,944,135, Cl. 236-102.000.
Kalish, Yehoshua. Scintillation spectrometer. 3,944,832, Cl. 250-361.000.
Kallestad, Steven B.; and May, Robert H., to Northstar Athletic Industries, Inc. Mouthpiece. 3,943,924, Cl. 128-136.000.
Kallianos, Andrew G.: *See*—
Cartwright, William F.; Means, Richard E.; and Kallianos, Andrew G., 3,943,943.
Kaman Sciences Corporation: *See*—
Church, Peter K.; and Knutson, Oliver J., 3,944,683.
Kamath, Venkatesh: *See*—
Mookherjee, Braja Dulal; Kamath, Venkatesh; and Shuster, Edward J., 3,944,621.
Kamezawa, Yasutoki: *See*—
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,944,422.
Kamikawa, Yozo: *See*—
Ikari, Shinichi; Hayakawa, Takumi; Kamikawa, Yozo; and Imai, Fumito, 3,944,431.
Kampe, Johannes F. E., to Garrett Corporation, The. Dirt extracting nozzle. 3,944,380, Cl. 415-1.000.
Kandel, Ronald E., to Kandel, Ronald E. Laryngoscope blade. 3,943,920, Cl. 128-11.000.
Kane, Edward, to K-Tron Corporation. Gravimetric feeder. 3,944,050, Cl. 198-37.000.
Kane, James; and Schweizer, Hanspeter, to RCA Corporation. Process for depositing transparent, electrically conductive tin containing oxide coatings on a substrate. 3,944,684, Cl. 427-109.000.
Kane, James: *See*—
Gale, Michael Thomas; and Kane, James, 3,944,420.
Kanebo Ltd.: *See*—
Hasunuma, Kyotaro; Kurokawa, Masahiro; and Abe, Takashi, 3,944,550.
Kaneda, Masahiro: *See*—
Ide, Fumio; Kishida, Kazuo; Deguchi, Seiji; and Kaneda, Masahiro, 3,944,630.
Kaneko, Fukuzo: *See*—
Yanagida, Tokio; Saito, Ariyoshi; Hosoda, Naoyuki; and Kaneko, Fukuzo, 3,944,414.
Kaneko, Masayasu; Ohshima, Syunji; and Asanuma, Yasuaki, to Sony Corporation. Automatic change-over notification for a receiver. 3,944,930, Cl. 325-364.000.
Kaneko, Teruo: *See*—
Ichimura, Takeo; and Kaneko, Teruo, 3,944,697.
Kanno, Ryoichi: *See*—
Hirota, Ryuichi; Kakuta, Hisashi; Motoba, Shigetado; Shimizu, Kenichi; Kanno, Ryoichi; and Narita, Mitsuaki, 3,944,650.
Kanzaki Paper Manufacturing Company, Ltd.: *See*—
Fujioka, Hironari; Matsushita, Takao; and Higaki, Taiji, 3,944,705.
Kaplan, Leonard, to Union Carbide Corporation. Catalytic process for polyhydric alcohols and derivatives. 3,944,588, Cl. 260-449.00L.
Kaplan, Sam H., to Zenith Radio Corporation. Shadow mask having ribs bounding rectangular apertures. 3,944,867, Cl. 313-403.000.
Karosas, Iozas Ionovich: *See*—
Apsit, Voldemar Voldemarovich; Dombur, Lev Eduardovich; Lutsavs, Yan Yanovich; Pugachev, Vladislav Alexandrovich; Schukin, Mikhail Ivanovich; Dirzhis, Sauljus Antanovich; Karosas, Iozas Ionovich; Pashtukas, Algis Vladislavovich; and Khlavnovich, Leonid Borisovich, 3,944,863.
Karr, George A., to Interlake, Inc. Combination strapping tool for plastic strap. 3,944,460, Cl. 156-494.000.
Karsh, Irving, to Bell & Howell Company. Information recording transport with tape tension equalization between distinct capstans. 3,945,036, Cl. 360-71.000.
Kasamatsu, Tadashi. Plastics-processing machine with combined performance of extrusion and injection. 3,944,191, Cl. 259-191.000.

Kasdan, Harvey L.: *See—*
Jensen, Niels P.; Kasdan, Harvey L.; and Thomasson, James T., 3,944,978.

Kashiwaya, Hideo: *See—*
Arii, Mitsuru; Kashiwaya, Hideo; and Uchida, Kuniharu, 3,943,755.

Kasper, Cass S., to Inter-Lakes Engineering Co. Machine and process for handling cathode plates or the like. 3,944,088, Cl. 214-89.000.

Kasuga, Masao: *See—*
Takahashi, Nobuaki; Kasuga, Masao; and Itoh, Yasuo, 3,944,755.

Katagiri, Nagatoshi, to Honda Giken Kogyo Kabushiki Kaisha. Frame assembly for two-wheeled motorized vehicle. 3,944,009, Cl. 180-33.00R.

Katcha, Frank F.: *See—*
Dieringer, Andrew M.; and Katcha, Frank F., 3,943,858.

Kato, Nobuyuki: *See—*
Ohtani, Tadoa; Kato, Nobuyuki; Kojima, Shigeru; Sakamoto, Yoichi; Tsukahara, Masaharu; Kojima, Kiyoshi; Konno, Isago; and Kubo, Takao, 3,944,445.

Kato, Nori: *See—*
Ito, Yuji; and Kato, Nori, 3,944,351.

Kato, Takayuki; and Yamazaki, Satoshi, to Toyota Jidosha Hanbai Kabushiki Kaisha; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Apparatus for measuring compression pressures in internal-combustion engine. 3,943,759, Cl. 73-115.000.

Kato, Tuyoshi: *See—*
Kuji, Yoichi; Kato, Tuyoshi; and Saito, Nagao, 3,944,478.

Katsushima, Atsuo; Imazu, Shinichi; Fukui, Shoshin; Iwatani, Akitoshi; and Akazawa, Tadashi, to Daikin Kogyo Kabushiki Kaisha. Hydroxy-polyfluoroalkyl-containing silane derivatives and manufacturing the same. 3,944,587, Cl. 260-448.80R.

Katsuyama, Harumi; and Ono, Hisatake, to Fuji Photo Film Co., Ltd. Spiro-pyrazoline derivatives and method for the production thereof. 3,944,556, Cl. 260-288.0CE.

Katz, Louis N. Filtration and circulation system and apparatus therefore. 3,943,659, Cl. 47-1.400.

Katz, Lyber: *See—*
Wesler, Allan B.; and Katz, Lyber, 3,943,747.

Katz, Saul N., to General Foods Corporation. Percolation process. 3,944,677, Cl. 426-432.000.

Katzbeck, John W.; and Cron, James C., to I-T-E Imperial Corporation. Elastomeric contamination seal. 3,944,716, Cl. 174-21.00R.

Katzschmann, Ewald, to Chemische Werke Witten GmbH. Process for the preparation of terephthalic acid. 3,944,602, Cl. 260-525.000.

Kauf, Russell D. Tape laying device and method. 3,944,161, Cl. 242-96.000.

Kaufman, Stanley: *See—*
Hacker, Joseph Michael; Kaufman, Stanley; Sabia, Raffaele Antonio; Sauer, Earl Salvator; Tidd, Charles Edward, Jr.; and Walker, Raymond, 3,944,717.

Kausov, Sergei Fedorovich. Semiconductor diode with layers of different but related resistivities. 3,945,029, Cl. 357-14.000.

Kawaguchiko Seismitsu Co., Ltd.: *See—*
Yokoyama, Eisuke, 3,944,030.

Kawai, Yoshihiro; and Takemura, Atushi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Combination turn-signal and hazard-warning switch means for an automobile. 3,944,765, Cl. 200-61.270.

Kawasaki, Kazuhiro: *See—*
Okada, Akira; Izumi, Ryoji; Ninomiya, Syogo; Tahara, Yukio; Takehara, Yuji; Suezawa, Masaaki; and Kawasaki, Kazuhiro, 3,944,144.

Kawasaki, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Exposure time indication apparatus. 3,944,370, Cl. 356-226.000.

Kawasaki, Masakuni: *See—*
Kosaka, Yujiro; Kuroki, Hitoshi; and Kawasaki, Masakuni, 3,944,695.

Kazakov, Georgy Petrovich: *See—*
Vainer, Shimon Abramovich; Temerev, Anatoly Fedorovich; Vainer, Savely Abramovich; Nikulin, Sergei Sergeevich; Kheifets, Matvei Evseevich; Usoltsev, Vadim Anatolievich; Matveev, Evgeny Fedorovich; Kazakov, Georgy Petrovich; Salkov, Vladimir Alexandrovich; and Malinin, Anatoly Isidorovich, 3,944,441.

Kazan, John, to American Cyanamid Company. Purification of d,d'-2,2'(ethylenediimino)di-1-butanol dihydrochloride. 3,944,616, Cl. 260-584.00R.

Kearney, Richard J. Pipe supports and hanger. 3,944,175, Cl. 248-59.000.

Keeler, Jack D.: *See—*
Greene, Ronald W.; Fagan, Edmund I.; and Keeler, Jack D., 3,944,217.

Keeler, Robert A., to Steelcase Inc. Stackable chair. 3,944,280, Cl. 297-239.000.

Keese, Larry S.: *See—*
Sietmann, Vernon H.; Keese, Larry S.; and Smith, Raymond L., 3,943,636.

Keishin Matsumoto: *See—*
Ikari, Shinichi; Hayakawa, Takumi; Kamikawa, Yozo; and Imai, Fumito, 3,944,431.

Keller, Alexander. Apparatus for sorting and conveying of objects. 3,944,062, Cl. 198-220.0BA.

Keller, Hans, to ITT Industries, Inc. Light-emitting diode connected to a coil. 3,944,854, Cl. 307-311.000.

Keller, Richard: *See—*
Augenblick, Harry A.; and Keller, Richard, 3,944,928.

Kelley, Fred W., Jr.: *See—*
Jewell, James G.; Kelley, Fred W., Jr.; and Titus, Charles H., 3,944,919.

Kellwood Company: *See—*
Cantwell, Robert R.; and Marquart, Tom E., 3,943,953.
Marquart, Tom Eugene; and Cantwell, Robert Roger, 3,943,952.

Kelsey-Hayes Company: *See—*
Bertolasi, Robert B., 3,944,288.

Kelver, William L., Jr.: *See—*
Zdanys, John; and Kelver, William L., Jr., 3,944,760.

Kemp, Kenneth C. Outboard motor mounting system. 3,943,877, Cl. 115-17.000.

Kendall Company, The: *See—*
Bolker, James H., 3,943,575.
Patel, Bhupendra C., 3,943,929.

Kennecott Copper Corporation: *See—*
McCarter, Michael K.; and Green, Dale J., 3,944,996.

Kenney, Frank T., to Love, Collete. Auxiliary automobile brake operator for actuation by front seat passenger. 3,943,795, Cl. 74-562.500.

Kent, Alan Hugh; and Fell, Peter Howard, to Plessey Handel und Investments AG. In-line coupling of two lengths of linear optical waveguide elements. 3,944,328, Cl. 350-96.00C.

Kent, Loren W. Tilting, sliding edge dispenser. 3,944,284, Cl. 298-14.000.

Kerst, Al F., to Monsanto Company. Substituted ethane diphosphonic acids and salts. 3,944,599, Cl. 260-502.40P.

Kessell, Archie; Kottsieper, Edward J.; Phelan, Charles S.; and Ranalli, Ralph, to Rohe Scientific Corporation. Automated centrifuge. 3,944,153, Cl. 233-26.000.

Kessler, Theodore P., to Timron, Inc. Fabric reel end frame. 3,944,157, Cl. 242-77.100.

Keuffel & Esser Company: *See—*
Frommeld, Hans-Dieter; and Rauhut, Herbert, 3,944,423.

Kheifets, Matvei Evseevich: *See—*
Vainer, Shimon Abramovich; Temerev, Anatoly Fedorovich; Vainer, Savely Abramovich; Nikulin, Sergei Sergeevich; Kheifets, Matvei Evseevich; Usoltsev, Vadim Anatolievich; Matveev, Evgeny Fedorovich; Kazakov, Georgy Petrovich; Salkov, Vladimir Alexandrovich; and Malinin, Anatoly Isidorovich, 3,944,441.

Khlavnovich, Leonid Borisovich: *See—*
Apsit, Voldemar Voldemarovich; Dombur, Lev Eduardovich; Lutsavs, Yan Yanovich; Pugachev, Vladislav Alexandrovich; Schukin, Mikhail Ivanovich; Dirzhis, Sauljus Antanovich; Karosas, Iozas Ionovich; Pashtukas, Algis Vladislavovich; and Khlavnovich, Leonid Borisovich, 3,944,863.

Kidd, Alan Lister, to Dorman Smith Switchgear Limited. Electrical circuit breaker. 3,944,959, Cl. 337-82.000.

Kiekhaefer Aeromarine Motors, Inc.: *See—*
Kiekhaefer, Elmer Carl, 3,943,876.

Kiekhaefer, Elmer Carl, to Kiekhaefer Aeromarine Motors, Inc. Water jet boat drive. 3,943,876, Cl. 115-12.00R.

Kiencke, Uwe, to Robert Bosch GmbH. Electronic timing circuit for engine ignition. 3,943,898, Cl. 123-117.00R.

Kienzle Uhrenfabriken GmbH: *See—*
Bauer, Manfred; Kroesche, Herbert; Sauter, Roland; and Stechmann, Helmut, 3,943,695.

Kilbourn, Dean R.: *See—*
Smith, Lester E.; and Kilbourn, Dean R., 3,944,249.

Kilby, Jack S.; Schweitzer, Robert F.; and McCrady, John, to Texas Instruments Incorporated. Paging system with selectively actuable pocket printers. 3,944,724, Cl. 178-4.10A.

Kim, He B.; and Driver, Michael C., to Westinghouse Electric Corporation. Application of facet-growth to self-aligned Shottky barrier gate field effect transistors. 3,943,622, Cl. 29-579.000.

Kimura, Shuji; and Ohmori, Sachio, to Nippon Kogaku K.K. Rotary shutter mechanism. 3,945,027, Cl. 354-250.000.

Kimura, Tetsuo: *See—*
Inoue, Shigeru; and Kimura, Tetsuo, 3,944,605.

Kine, Benjamin B.: *See—*
Greenwald, Harold L.; and Kine, Benjamin B., 3,944,513.

King, Ian Robert; and Hardy, Francis R. F., to Laporte Industries Limited. Lactones. 3,944,572, Cl. 260-343.600.

King, John Alfred: *See—*
Robertson, Thomas Alexander; and King, John Alfred, 3,943,853.

King, John O., Jr. Coldwork system with delay split sleeve. 3,943,748, Cl. 72-393.000.

King, Wendell L.; and Stokes, Kenneth B., to Medtronic, Inc. Gas absorbing implantable electrical medical device. 3,943,937, Cl. 128-419.00P.

Kinnear, Joseph D. Electrical disconnect switch. 3,944,847, Cl. 307-131.000.

Kino, Gordon S., to Leland Stanford University, The Board of Trustees of the. Method and apparatus for improving acousto-electric scanning. 3,944,732, Cl. 178-7.100.

Kinsley, Homan Benjamin, Jr., to Ethyl Corporation. Tree shears. 3,943,984, Cl. 144-34.00R.

Kinugawa, Masumi, to Nippondenso Co., Ltd. Air-flow metering device for fuel injection system of internal combustion engine. 3,943,891, Cl. 123-32.0EA.

Kioustelidis, Johannes: *See—*
Rieger, Manfred; and Kioustelidis, Johannes, 3,944,606.

Kirkland, W. Dean, to Cutter Laboratories, Inc. Two-way ball valve. 3,943,959, Cl. 137-238.000.

Kirkwood, Creal E.; and Bauer, Veral V. Power steering system for boats. 3,943,878, Cl. 115-35.000.

Kishi, Tuneo; and Nakano, Seizo, to Hitachi, Ltd. Operating apparatus for circuit breaker. 3,943,777, Cl. 74-2.000.

Kishida, Kazuo: *See—*
Ide, Fumio; Kishida, Kazuo; Deguchi, Seiji; and Kaneda, Masahiro, 3,944,630.

Kiss, John David: *See—*
Moore, William Cooper; Kiss, John David; and Dean, John Richard, 3,944,809.

Kissawetter, James E.: *See—*
Fallos, George; and Kissawetter, James E., 3,944,214.

Kita, Yasuo, to Shimadzu Seisakusho, Ltd. Hydraulic motors and pumps. 3,943,826, Cl. 91-488.000.

Kitagaki, Tadaharu; Takahashi, Yoshio; and Takita, Kiyoshi, to Sandoz, Inc. Synergistic acaricide compositions. 3,944,664, Cl. 424-93.000.

Kitaura, Toshihiko: *See—*
Mizutani, Kazunori; Kitaura, Toshihiko; and Noo, Minoru, 3,943,623.

Klaue, Hermann. Planetary gear drive with power distribution. 3,943,780, Cl. 74-15.860.

Klein, Elias: *See—*
Rembaum, Alan; Yen, Shiao-Ping S.; and Klein, Elias, 3,944,485.

Kleiner, Eduard K.; and Spivack, John D., to Ciba-Geigy Corporation. Polyalkylene glycol esters of hindered phenols substituted alkanoic acid. 3,944,594, Cl. 260-473.00S.

Klemm, Kurt; and Langenscheid, Erhard, to Byk Gulden Lomberg Chemische Fabrik GmbH. Formylazapentadienenitriles. 3,944,667, Cl. 424-244.000.

Klockner-Humboldt-Deutz AG: *See—*
Eichholz, Gunter; and Wehren, Peter, 3,944,145.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Stockmann, Helmut; and Jakobs, Willy, 3,944,146.

Kluth, Wilhelm, to Societe Industrielle de Brevets et D'Etudes S.I.B.E. Throttle return systems for carburettors. 3,943,907, Cl. 123-198.0DB.

Knapp, Alfons. Cock unit for hydraulic systems, with interchangeable delivery spouts. 3,943,961, Cl. 137-269.000.

Knapp, Alfons. Single control mixing valve with an auxiliary member carrying the sealing seat. 3,943,970, Cl. 137-597.000.

Knight, Lee H., Jr.: *See—*
Short, Joe T.; Knight, Lee H., Jr.; Frentress, Zane; and Boteler, Winston C., 3,943,865.

Knowles, Peter George: *See—*
Mathews, Carl Fraser; Deverell, Christopher; Pears, Gordon Edmund Alfred; and Knowles, Peter George, 3,944,699.

Knowles, Richard Norris. Preparation of salts of antimony (V) esters. 3,944,586, Cl. 260-429.00R.

Knutson, Oliver J.: *See—*
Church, Peter K.; and Knutson, Oliver J., 3,944,683.

Kobayashi, Hideyuki: *See—*
Ishigami, Noriakira; and Kobayashi, Hideyuki, 3,944,293.

Kobayashi, Kazuhiko: *See—*
Yasumoto, Seiichi; Kobayashi, Kazuhiko; Yasuda, Isao; and Itoh, Ken, 3,944,975.

Kobayashi, Takeshi; and Tanaka, Yoshiharu, to Mitsui Mining & Smelting Co., Ltd. Device for detecting short-circuit between electrodes in electrolytic cell. 3,944,995, Cl. 340-253.00A.

Koeleman, Gerardus A. J.: *See—*
Vola, Mathias J. J. M.; Koeleman, Gerardus A. J.; and Peeters, Franciscus M. J., 3,943,886.

Koeng, Frederick: *See—*
Cohen, Hyman L.; Koeng, Frederick; and Ponticello, Ignazio, 3,944,424.

Koenig, Thomas J., to General Electric Company. Locking device for spade-type electrical connectors. 3,944,312, Cl. 339-59.00R.

Koga, Isao: *See—*
Okamoto, Takehiko; Ohashi, Tamihiro; and Koga, Isao, 3,944,622.

Kogan, Petr Grigorievich: *See—*
Derzhavets, Abram Yakovlevich; Kogan, Petr Grigorievich; and Tabachnikov, Viktor Iosifovich, 3,944,489.

Kohler, George O.: *See—*
Saunders, Robert M.; and Kohler, George O., 3,944,537.

Kohler, Werner, to Siemens Aktiengesellschaft. Overcurrent protection device. 3,944,771, Cl. 200-144.00B.

Kojima, Kiyoshi: *See—*
Ohtani, Tadoa; Kato, Nobuyuki; Kojima, Shigeru; Sakamoto, Yoichi; Tsukahara, Masaharu; Kojima, Kiyoshi; Konno, Isago; and Kubo, Takao, 3,944,445.

Kojima, Shigeru: *See—*
Ohtani, Tadoa; Kato, Nobuyuki; Kojima, Shigeru; Sakamoto, Yoichi; Tsukahara, Masaharu; Kojima, Kiyoshi; Konno, Isago; and Kubo, Takao, 3,944,445.

Kolbe, Joachim. Vehicle banking arm construction. 3,944,246, Cl. 280-112.00A.

Kolbuch, Henry M. Apparatus for removing a plurality of seperate elements and methods of utilizing same. 3,943,588, Cl. 10-162.00R.

Kolenik, Steven A.: *See—*
Hursen, Thomas F.; Kolenik, Steven A.; and Purdy, David L., 3,944,438.

Kongo Co., Ltd.: *See—*
Taniwaki, Genshi, 3,944,309.

Koninklijke Emballage Industrie Van Leer B.V.: *See—*
Coppens, Matheus Johannes Martinus, 3,944,114.

Konishi, Ryoichi: *See—*
Tnoue, Mutsuhiro; and Konishi, Ryoichi, 3,944,361.

Konno, Isago: *See—*
Ohtani, Tadoa; Kato, Nobuyuki; Kojima, Shigeru; Sakamoto, Yoichi; Tsukahara, Masaharu; Kojima, Kiyoshi; Konno, Isago; and Kubo, Takao, 3,944,445.

Kopal, Jaroslav; Jansa, Milos; and Deiss, Jaroslav, to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi. Shockless needles particularly for circular knitting machine. 3,943,732, Cl. 66-123.000.

Kopanda, Joseph E.: *See—*
Nickelsen, Hubert O.; Kopanda, Joseph E.; and Piasecki, Felix J., 3,944,426.

Kordesch, Karl V., to Union Carbide Corporation. Bonded component assembly for flat cells and method therefor. 3,944,435, Cl. 156-111.000.

Korinek, Thomas L.: *See—*
Lee, Vernon C.; and Korinek, Thomas L., 3,944,275.

Kosaka, Yujiro; Kuroki, Hitoshi; and Kawasaki, Masakuni, to Toyo Soda Manufacturing Co., Ltd. Heat printing sheet. 3,944,695, Cl. 428-200.000.

Koshelev, Vladimir Alexeevich. Clutch with piston modulating valve. 3,944,036, Cl. 192-109.00F.

Kostelecky, Clarence L.: *See—*
Steinberg, Richard W.; McClocklin, Samuel B.; and Kostelecky, Clarence L., 3,943,843.

Kotos, Peter; and Yen, Patrick P., to General Electric Company. Flux-transfer trip device for a circuit breaker. 3,944,957, Cl. 335-174.000.

Kottsieper, Edward J.: *See—*
Kessell, Archie; Kottsieper, Edward J.; Phelan, Charles S.; and Ranalli, Ralph, 3,944,133.

Kouchi, Toshihiro: *See—*
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,944,422.

Kovacs, Lloyd; and Cherney, Dale Mark, to Hayssen Manufacturing Company. Packaging apparatus. 3,943,683, Cl. 53-51.000.

Kovalev, Leonid Anisimovich: *See—*
Misulovin, Leonid Yakovlevich; Panin, Igor Ivanovich; Soloveichik, Yakov Girshevich; Kovalev, Leonid Anisimovich; and Zhoglo, Viktor Olimpievich, 3,944,956.

Koyanagi, Haruo; Takahashi, Masayoshi; Yamauchi, Nobuharu; Matsumura, Masaji; and Morimoto, Katsuhide, to Mitsubishi Denki Kabushiki Kaisha; and Nissan Motor Company, Limited. Digital logical sequence controller. 3,944,987, Cl. 340-172.500.

Kozlowski, Kenneth R.: *See—*
Shoberg, Ralph S.; and Kozlowski, Kenneth R., 3,943,761.

Kraftwerk Union Aktiengesellschaft: *See—*
Wolf, Helmut; Bohm, Wolfgang; and Stucker, Erwin, 3,943,758.

Krasnov, Mikhail Mikhailovich. Goniolens. 3,943,931, Cl. 128-303.100.

Kratz, Bernhard: *See—*
Meisner, Alfred; Oellig, Oskar; Neubauer, Josef; and Kratz, Bernhard, 3,944,795.

Kraus, Helmut; and Distler, Walter, to Siemens Aktiengesellschaft. Liquid jet recorder. 3,945,020, Cl. 346-75.000.

Kraus, Helmut; and Wiesmuller, Siegfried, to Siemens Aktiengesellschaft. Liquid jet recorder. 3,945,021, Cl. 346-75.000.

Kraus, Robert A.: *See—*
Whalen, Mark E.; Trepanier, Norman W.; Kraus, Robert A.; and Malleck, Joseph W., 3,943,617.

Krause, Erich, to Universal Maschinenfabrik. Control device for knitting machines. 3,943,730, Cl. 66-70.000.

Kray, Raymond J., to Ciba-Geigy Corporation. N-cyanosulfonamide resins and intermediates therefor and products thereof. 3,944,526, Cl. 260-79.30M.

Kreft, Holger: *See—*
Erfurt, Horst-Lothar; Kreft, Holger; and Tronsberg, Walter, 3,943,867.

Krenzer, John, to Velsicol Chemical Corporation. Method of increasing the yield of plants having storage organs by treatment with thiadiazolylimidazolines. 3,944,409, Cl. 71-90.000.

Krenzer, John, to Velsicol Chemical Corporation. Substituted oxadiazolidine dione herbicides. 3,944,410, Cl. 71-92.000.

Krepinsky, Jiri Jan: *See—*
Ferrari, Giorgio; and Krepinsky, Jiri Jan, 3,944,582.

Kreuzer, Dieter, to Fichtel & Sachs AG. Hydropneumatic shock absorbing mounted bumper. 3,944,270, Cl. 293-70.000.

Krimsky, Leonard C.: *See—*
Lee, Frank X.; Krimsky, Leonard C.; and Freytag, Donald R., 3,944,151.

Krishna, Surinder; and Chu, Chang Kwei, to Westinghouse Electric Corporation. High speed, high power plasma thyristor circuit. 3,945,028, Cl. 357-13.000.

Kroesche, Herbert: *See—*
Bauer, Manfred; Kroesche, Herbert; Sauter, Roland; and Stechmann, Helmut, 3,943,695.

Kronman, Joseph H.; and Goldman, Melvin. Spoon excavator for applying chemically acting tooth decay attacking fluid. 3,943,628, Cl. 32-40.00R.

Kronogard, Sven Olof, to United Turbine AB and Co., Kommanditbolag. Cooling passages through resilient clamping members in a gas turbine power plant. 3,943,703, Cl. 60-39.16R.

Krumme, Jens-Peter; and Hill, Bernhard, to U.S. Philips Corporation. Magneto-optical information storage device using photoconductive control element. 3,944,992, Cl. 340-174.0YC.

Krupotich, Edward A.: *See—*
Bingham, George H.; and Krupotich, Edward A., 3,943,807.

Krupp-Koppers GmbH: *See—*
Schwall, Fritz; Preusser, Gerhard; and Schulze, Martin, 3,944,483.

Kruse, Marvin A.: *See—*
Aryamane, Avinash; and Kruse, Marvin A., 3,944,768.

Kruszewski, William Frank: *See—*
Arumugham, Rangaswamy; Kruszewski, William Frank; and Siwko, Karol, 3,944,725.

Kubicek, Edward A., to General Motors Corporation. Article transfer apparatus. 3,944,046, Cl. 198-21.000.

Kubis, Heribert; and Deschler, Gerhard, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. One piece piston connected to a connecting rod for high speed four-stroke cycle internal combustion engines. 3,943,908, Cl. 123-193.00P.

Kubo, Takao: *See—*
Ohtani, Tadoa; Kato, Nobuyuki; Kojima, Shigeru; Sakamoto, Yoichi; Tsukahara, Masaharu; Kojima, Kiyoshi; Konno, Isago; and Kubo, Takao, 3,944,445.

Kuechler, Irvin R., to Vent-Cair, Inc. Apparatus for removing fumes from the space above a cooking appliance in a restaurant. 3,943,836, Cl. 98-115.00K.

Kuehn, Jack W., to Tote Bulk Handling, Inc. Method of preparing and separating mixtures of moldable plastic and additive agents. 3,944,075, Cl. 209-71.000.

Kugler, Kurt, to Mashinenfabrik Reinhausen Gebruder Scheubeck K. G. System for effecting tap changes of tapped transformer windings by means of thyristors. 3,944,913, Cl. 323-43.50S.

Kuhla, Donald E.: *See—*
Evanega, George R.; Kuhla, Donald E.; and Sarges, Reinhard, 3,944,524.

Kuhlman, Harvey G. Moldable food depositing apparatus. 3,943,601, Cl. 17-32.000.

Kuhlmann, George E., to Standard Oil Company. Quality of phthalic acids improved by strong inorganic acids. 3,944,601, Cl. 260-524.00R.

Kuhn, Billy J. Motor vehicle frame assembly. 3,944,245, Cl. 280-106.50R.

Kuhn, Hans-Robert, to Electroacustic GmbH. Means and method of reducing interference in multi-channel reproduction of sounds. 3,944,748, Cl. 179-15.0BT.

Kuhnle, Judith A.: *See—*
Randall, John M.; Hautala, Earl; Waiss, Anthony C., Jr.; and Kuhnle, Judith A., 3,944,415.

Kuji, Yoichi; Kato, Tuyoshi; and Saito, Nagao, to Mitsubishi Denki Kabushiki Kaisha. Electrolytic drainage treating apparatus. 3,944,478, Cl. 204-275.000.

Kullmann, Helmut: *See—*
Kunz, Albert; and Kullmann, Helmut, 3,943,689.

Kummel, Louis; Morhart, Rudolf; and Pollak-Banda, Erich, to Zahnraderfabrik Renk Aktiengesellschaft, Firma. Planar gear train. 3,943,788, Cl. 74-411.000.

Kunert, Heinz; Moebs, Heinz; and Sauer, Gerd, to Saint-Gobain Industries. Windshield antenna with coupling network in the leadin. 3,945,014, Cl. 343-713.000.

Kuntzel, Heiner: *See—*
Dubs, Paul; Kuntzel, Heiner; Pesaro, Mario; and Schmidt, Harald, 3,944,561.

Kunz, Albert; and Kullmann, Helmut, to HAMEL Projektierungs- und Verwaltungs-AG. Method of and apparatus for twisting yarn or thread. 3,943,689, Cl. 57-34.00R.

Kupsky, George A., to Panel Technology, Inc. Segmented gas discharge display panel device. 3,944,868, Cl. 313-517.000.

Kurcz, Joseph F., to Signode Corporation. Zinc dust-coated steel ligatures. 3,944,712, Cl. 428-418.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Yoshikawa, Shinsuke; Sasaki, Tohru; and Ichii, Takao, 3,943,614.

Kurisaki, Konomu: *See—*
Honna, Kosaku; Shimizu, Nobuaki; and Kurisaki, Konomu, 3,944,626.

Kurokawa, Masahiro: *See—*
Hasunuma, Kyotaro; Kurokawa, Masahiro; and Abe, Takashi, 3,944,550.

Kuroki, Hitoshi: *See—*
Kosaka, Yujiro; Kuroki, Hitoshi; and Kawasaki, Masakuni, 3,944,695.

Kurth, Carl Ferdinand, to Bell Telephone Laboratories, Incorporated. Monolithic crystal filter. 3,944,951, Cl. 333-72.000.

Kurz, Eduard: *See—*
Barth, Hans-Jochen; Reinecke, Herbert; Hollenbach, Georg; and Kurz, Eduard, 3,944,508.

Kuts, Mathew, to B. F. Goodrich Company, The. Tire truing machine. 3,943,806, Cl. 82-49.000.

Kuzin, Boris Vladimirovich: *See—*
Ioanesian, Jury Rolenovich; and Kuzin, Boris Vladimirovich, 3,944,303.

Kwasniak, Jak, to Politechnika Lodzka. Separator for gas dehumidization. 3,944,407, Cl. 55-455.000.

Kwok, Kenneth, to Data Source Corporation. Method and apparatus for illuminating an object bearing indicia. 3,944,979, Cl. 340-146.3AG.

Kwon, Joon Taek, to Lummus Company, The. Process for treating sulfide-containing materials. 3,944,486, Cl. 210-59.000.

Kyuma, Tatsuo: *See—*
Naramoto, Isao; Kyuma, Tatsuo; and Akazome, Giichi, 3,944,613.

L. Mombers B.V.: *See—*
Mombers, Wilhelmus L. R., 3,944,700.

Laboratoire L. Lafon: *See—*
Lafon, Louis, 3,944,549.

Lacambre, Jacques: *See—*
de Rosa, Daniel; and Lacambre, Jacques, 3,944,276.

La Chiusa, Arturo A., to Auto-Safe Research and Development Corp. Brake and accelerator controls for operating a motor driven vehicle. 3,944,012, Cl. 180-77.00R.

Lacombe-Allard, Jean-Francois, to Automatisme & Technique. Apparatus for the continuous production of link chains. 3,943,702, Cl. 59-4.000.

Lacorre, Jean; and Champenois, Michel, to Societe D'Etudes, Recherches Et Constructions Electroniques Sercel. Point by point positioning apparatus. 3,944,902, Cl. 318-593.000.

LaCroix, Roger Claude, to Comptoir Lyon-Alemond-Louyot. Catalytic structure. 3,944,505, Cl. 252-466.00B.

Lafitte, C. Wayne; and Thompson, Thomas L. Batch weighing system. 3,944,004, Cl. 177-121.000.

Lafon, Louis, to Laboratoire L. Lafon. Amino derivatives of 1,4-benzodioxan. 3,944,549, Cl. 260-256.40N.

Laitram Corporation, The: *See—*
Fowler, John T., 3,944,813.

Lalick, Michael J. Pocket assembly for a pool table. 3,944,224, Cl. 273-12.000.

Lalli, Domenico: *See—*
Banzoli, Valeriano; De Nora, Giovanni; Di Tella, Vincenzo; Lalli, Domenico; and Tempo, Gianfranco, 3,943,724.

Lamantia, Charles R.: *See—*
Field, Edwin L.; Lamantia, Charles R.; Lunt, Richard R.; Oberholtzer, James E.; and Valentine, James R., 3,944,649.

Lamb, Thomas. Storage tank. 3,944,106, Cl. 220-5.00A.

Lamey, Cornel L.: *See—*
Mueller, Hans W.; and Lamey, Cornel L., 3,944,041.

Landen, Paulette S., executrix: *See—*
Landen, William James, deceased; and Landen, Paulette S., executrix, 3,944,101.

Landen, William James, deceased; and by Landen, Paulette S., executrix. Safety closure. 3,944,101, Cl. 215-216.000.

Landgraf, Hermann, to Siemens Aktiengesellschaft. Electrical tooth pulp tester having tiltable head. 3,943,919, Cl. 128-2.10R.

Lane, Robert: *See—*
Wright, Thomas Henry; and Lane, Robert, 3,943,596.

Lange, Karlheinz, to Dr. Ing.h.c.F. Porsche Aktiengesellschaft. Installation for the catalytic afterburning of exhaust gases of a multi-cylinder internal combustion engine. 3,943,710, Cl. 60-288.000.

Lange, Raymond J.: *See—*
Clemens, David H.; and Lange, Raymond J., 3,944,507.

Langenscheid, Erhard: *See—*
Klemm, Kurt; and Langenscheid, Erhard, 3,944,667.

Langford, Aubrey F. W.: *See—*
Jones, Neal K.; Langford, Aubrey F. W.; Anderson, Donald; and Crook, Walter R., 3,944,806.

Langley Corporation: *See—*
Welsh, James W., 3,944,310.

Lanusse, Marie Marguerite. Fluid-product projection apparatus for maintenance of various articles. 3,943,591, Cl. 15-29.000.

LaPointe, Roger F. Remote shift. 3,944,013, Cl. 180-77.00R.

Laporte Industries Limited: *See—*
King, Ian Robert; and Hardy, Francis R. F., 3,944,572.

Lariccia, Anthony H.; and Lariccia, Mary L. Eliminating the safety hazard in oral dissolution of a solid. 3,943,928, Cl. 128-260.000.

Lariccia, Mary L.: *See—*
Lariccia, Anthony H.; and Lariccia, Mary L., 3,943,928.

La Rosa, Frank. Casement window conversion unit. 3,943,662, Cl. 49-63.000.

Larry, John Robert, to Du Pont de Nemours, E. I., and Company. High-adhesion conductors. 3,944,696, Cl. 428-208.000.

Larsen Electronics, Inc.: *See—*
Larsen, L. James, 3,944,722.

Larsen, Herbert, to Siemens Aktiengesellschaft. Connection between two light conducting glass fibers. 3,944,327, Cl. 350-96.00C.

Larsen, L. James, to Larsen Electronics, Inc. Antenna mount for vehicles. 3,944,722, Cl. 174-153.00A.

Larsson, Lars Goran: *See—*
Bruke, Richard Leroy; and Larsson, Lars Goran, 3,944,127.

Lasky, Segismundo Nates. Method of manufacturing threaded nuts and threaded nut articles produced by such method. 3,943,587, Cl. 10-1.00A.

Lassanske, George G., to Outboard Marine Corporation. Endless cleated track. 3,944,006, Cl. 180-9.620.

Laubie, Michel: *See—*
Regnier, Gilbert; Canevari, Roger; Laubie, Michel; and Poignantw, Jean-Claude, 3,944,551.

Laurent, Henry; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Novel pregnane-21-oic acid derivatives. 3,944,577, Cl. 260-397.100.

Laurent, Jean: *See—*
Cholet, Jacques; Laurent, Jean; and Magneville, Pierre, 3,944,031.

Laursen, Ove: *See—*
Jacobsson, Kurt Arne Gunnar; and Laursen, Ove, 3,944,156.

Lawrence, John Leslie: *See—*
Sword, Geoffrey; Lawrence, John Leslie; Raggett, Stephen Richard; and Blakemore, Bernard, 3,944,739.

Lawrence, John P., to Goodyear Tire & Rubber Company, The. N,N'-bisimidothio-diamines. 3,944,552, Cl. 260-268.0BC.

Lawrence Pesak Associates, Inc.: *See—*
Jollie, Henry D., 3,943,797.

Lawrence Peska Associates, Inc.: *See—*
Caton, Joe L.; and Caton, Larry, 3,944,140.
Chao, Albert, 3,944,803.
Easton, Maysel Marie, 3,944,138.
Fasano, Thomas, 3,944,220.
Miller, John H., 3,943,726.
Reyes, Gil, 3,943,581.

Lazar, Ferenc: *See—*
Solymar, Karoly; Zambo, Janos; Orban nee Kelemen, Marika; Bujdoso, Erno; Feher, Ivan; Ozvald, Zoltan; Voros, Istvan; Ferenczi, Tibor; Toth, Pal; Lazar, Ferenc; Pinter, Tihamer; Sigmond, Gyorgy; Siklosi, Peter; Wentzely, Kalman; Lengyel, Laszlo; and Matyasi, Jozsef, 3,944,648.

Lazzari, Jean-Pierre, to Compagnie Internationale Pour l'Informatique. Read-write magnetoresistive transducer having a plurality of MR elements. 3,945,038, Cl. 360-113.000.

Lear Siegler, Inc.: *See—*
Buscher, Richard George; and Soderlund, Gunnar M., 3,944,974.

Learmont, Tom; Nelmark, Jack D.; Martin, Gary E.; and Raske, Theodore F., to Bucyrus-Erie Company. Resilient guide bushing mounting for blast hole drills or the like. 3,944,300, Cl. 308-4.00R.

Leckie, Robert Malcolm Paul. Toy flying machines. 3,943,657, Cl. 46-80.000.

Lecordier, Michel G., to Compagnie Francaise des Petroles, S.A.; Etudes Petrolieres Marines, S.A.R.L.; Ateliers et Chantiers de Bretagne - A.C.B. - S.A.; Compagnie Maritime d'Expertises, S.A.; and Compagnie Generale pour les Developpements Operationnels des Richesses sour-Marines (Doris) S.A. Apparatus for internally checking well pipe bore and for automatically sealing leaks therein. 3,943,982, Cl. 138-89.000.

Lederer, George H. Container orienting device. 3,944,063, Cl. 198-255.000.

Lee, Frank X.; Krimsky, Leonard C.; and Freytag, Donald R., to Worldwide Converting Machinery, Inc. Alternate side web splicing apparatus. 3,944,151, Cl. 242-58.300.

Lee, Haynes A., Jr.; and Rapp, Charles F., to Owens-Illinois, Inc. Faraday rotator device including lithia-silicate glass articles containing Tb_2O_3 and methods of using same. 3,944,329, Cl. 350-151.000.

Lee, Tien Shuey, to Union Carbide Corporation. Rechargeable galvanic cell and electrolyte therefor-II. 3,944,430, Cl. 136-30.000.

Lee, Vernon C.; and Korinek, Thomas L. Truck box construction. 3,944,275, Cl. 296-28.00M.

Lefebvre, Yvon: *See—*
Abraham, Nedumparambil A.; and Lefebvre, Yvon, 3,944,541.

Leibowitz, Marshall, to Timex Corporation. Electrochromic display with porous separator. 3,944,333, Cl. 350-160.00R.

Leiby, Clare C., Jr.: *See—*
Prasad, Balram; and Leiby, Clare C., Jr., 3,944,946.

Leight, Howard S. Ear protector assembly. 3,943,925, Cl. 128-152.000.

Lejdegard, Sixten Harald, to Bulten-Kanthal AB Hallstahammar. Screw driver bit. 3,943,986, Cl. 145-50.00B.

Leland Stanford University, The Board of Trustees of the: *See—*
Kino, Gordon S., 3,944,732.

Lelaquet, Pierre: *See—*
Daeninckx, Jean; and Lelaquet, Pierre, 3,943,582.

Lemelson, Jerome H. Process of forming an irregular surface on the inside of a tube or pipe. 3,944,641, Cl. 264-70.000.

Lemoine, Roger: *See—*
Aubert, Gilles; Lemoine, Roger; Maury, Andre; Moulin, Maurice; and Tomachevsky, Erik, 3,943,756.

Le Mouel, Bernard, to Societe Lannionnaise d'Electronique Sle-Citerel. Demodulator assembly for trains with differential phase modulation. 3,944,939, Cl. 329-104.000.

Lengyel, Laszlo: *See—*
Solymar, Karoly; Zambo, Janos; Orban nee Kelemen, Marika; Bujdoso, Erno; Feher, Ivan; Ozvald, Zoltan; Voros, Istvan; Ferenczi, Tibor; Toth, Pal; Lazar, Ferenc; Pinter, Tihamer; Sigmond, Gyorgy; Siklosi, Peter; Wentzely, Kalman; Lengyel, Laszlo; and Matyasi, Jozsef, 3,944,648.

Lennox Industries Inc.: *See—*
Dirk, William R., 3,944,381.

Leonard, Jean; and Touzet, Georges, to Union Des Cooperatives Forestieres D'Aquitaine (U.C.F.A.); and Association Foret Cellulose (A.F.O.C.E.L.). Planting machine for planting plants in clods. 3,943,863, Cl. 111-2.000.

Leowald, Karl-Friedrich: *See—*
Beckmann, Oskar; Habock, Adolf; and Leowald, Karl-Friedrich, 3,944,815.

Leral, Murray M. Outboard engine storage bracket. 3,943,585, Cl. 9-1.00R.

Lerro, Luigi. Mechanism usable with locks and two applications wherein said mechanism is used. 3,943,737, Cl. 70-106.000.

Lesner, Richard S., to Chicago Pneumatic Tool Company. Portable screw driving tool having screw depth control feature. 3,943,800, Cl. 81-52.40R.

Le Van, Wayne P., to Van Allyn, Inc. Method and apparatus for generating electricity by vehicle and pedestrian weight force. 3,944,855, Cl. 310-69.000.

Lever Brothers Company: *See—*
Alterman, David S.; and Chun, Kil Whan, 3,944,497.
Gutierrez, Eddie N.; and Reardon, Robert C., Jr., 3,944,568.
van Pelt, Johannes George; Prins, Albertus; van Roon, Johannes Hendrik; and Smits, Petrus, 3,944,680.

Levin, Ezra; and Mosser, John Darwin, to VioBin Corporation. Process of preparing food products from bones. 3,944,655, Cl. 426-32.000.

Leviton Manufacturing Co., Inc.: *See—*
Weitzman, Milton J.; and Rosenbaum, Saul, 3,944,314.

Levy, Boris, to Polaroid Corporation. Surface modification by electrical discharge in a mixture of gases. 3,944,709, Cl. 428-409.000.

Levy, Richard H.; and Janes, George Sargent, to Jersey Nuclear-Avco Isotopes, Inc. Method and apparatus for the separation of isotopes. 3,944,825, Cl. 250-282.000.

Levy, Richard H.: *See—*
Pike, Charles T.; and Levy, Richard H., 3,944,947.

Lewallyn, Michael A.: *See—*
Feighery, James M.; and Lewallyn, Michael A., 3,943,864.

Lewis, James M.; and Newyear, Raymond W., to Horizons Incorporated, a division of Horizons Research Incorporated. Process for simultaneous development and etch of photoresist and substrate. 3,944,421, Cl. 96-36.000.

Lewis, Ronald A., to Tel-Pac, Inc. Disposable physiological telemetric device. 3,943,918, Cl. 128-2.10A.

Liberty Glass Company: *See—*
Brockway, M. Clifford; and Sharpe, Robert E., 3,944,100.

Licentia Patent-Verwaltungs-GmbH: *See—*
Minner, Willy, 3,944,851.

Lieber, Hans-Wilhelm, to Fernsteuergerate, Kurt Oelsch KG. Workpiece surface area determination. 3,944,390, Cl. 23-230.00R.

Liedholz, Gerhard A.: *See—*
Hogg, Walter R.; Liedholz, Gerhard A.; and Coulter, Wallace H., 3,944,917.

Ligenza, Joseph Raymond: *See—*
Kahng, Dawon; and Ligenza, Joseph Raymond, 3,945,031.

Liggett & Myers Incorporated: *See—*
Cartwright, William F.; Means, Richard E.; and Kallianos, Andrew G., 3,943,943.

Lind, Erwin, to Hoechst Aktiengesellschaft. Process for the electrophotographic production of printing plates. 3,944,417, Cl. 96-1.00R.

Lindahl, Harold T.; and Maggos, Theodore, to IS Incorporated Systems Company; and Meckler, Gershon, part interest to each. Cellular floor, wall or the like structure. 3,943,673, Cl. 52-98.000.

Linde Aktiengesellschaft: *See—*
Stuhr, Hans-Waldemar, 3,943,712.

Lindemann, ; Weise, Lutz; and Luhdorff, Dieter, to WABCO Westinghouse GmbH. Antiskid brake control system affording acceleration control of a skidding wheel running on a low adhesion roadway. 3,944,291, Cl. 303-21.00A.

Lindemann Maschinenfabrik GmbH: *See—*
Tillmanns, Josef, 3,944,091.

Linden Alimak AB: *See—*
Andersson, Rune, 3,943,716.

Lindermann, Herbert; and Niemeyer, Ludwig, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Device for measuring and controlling the gap between rollers in a roller stand. 3,943,634, Cl. 33-182.000.

Lininger, Thomas C., to Electro-Voice, Incorporated. Electret microphone. 3,944,756, Cl. 179-111.00E.

Linker, Elliott C., to Electronic Engineering Co. of California. Spindle and latch. 3,944,153, Cl. 242-68.300.

Liskey Aluminum Inc.: *See—*
Ray, George F., 3,943,674.

Littelfuse, Inc.: *See—*
Aryamane, Avinash; and Kruse, Marvin A., 3,944,768.

Little, David W., to General Electric Co. Static overcurrent relay. 3,944,890, Cl. 317-36.0TD.

Little, William S.: *See—*
Snelling, Christopher; Little, William S.; and Townsend, Robert H., 3,944,353.

Litton Systems, Inc.: *See—*
Wyse, Stanley F., 3,943,778.

Liu, Hsin. Method for recovering metals. 3,944,412, Cl. 75-10.00R.

Lloyd, Michael K.; and Rosenberger, Paul C., to Caterpillar Tractor Co. Towing valve arrangement for fail-safe brake system. 3,944,295, Cl. 303-89.000.

Loeser, Harrison T.; and Caldwell, Hamlin A., Jr., to United States of America, Navy. Air dropped linear acoustic detector. 3,944,964, Cl. 340-2.000.

Lohbauer, Kenneth R.: *See—*
Bianchetta, Donald L.; Lohbauer, Kenneth R.; and Rhodes, Sammy J., 3,943,825.

Lohe, Johannes: *See—*
Biermann, Willi; Iversen, Klaus; and Lohe, Johannes, 3,944,467.

Longview Fibre Company: *See—*
Budington, Richard V.; and Bradley, Michael F., 3,944,072.

Look, Thomas F.: *See—*
Podvin, Richard T.; and Look, Thomas F., 3,944,457.

Loos, Herbert, to Carl Hurth Maschinen und Zahnradfabrik. Toothed tool having cutting edges on the tooth surfaces. 3,943,822, Cl. 90-1.60A.

LoPresti, Roy F., to Peskin, Samuel. Multipositionable portable and collapsible horizontal bar exercising apparatus. 3,944,219, Cl. 272-62.000.

L'Oreal: *See—*
Daeninckx, Jean; and Lelaquet, Pierre, 3,943,582.

Lotz, Walter E. Time delay for interleaving machine. 3,943,684, Cl. 53-66.000.

Love, Collete: *See—*
Kenney, Frank T., 3,943,795.

Loveless, Frederick C., to Uniroyal, Inc. Solution diene elastomers by alkyl lithium catalysis. 3,944,528, Cl. 260-83.700.

Lowe, Earl F., to Interlake, Inc. Coke oven lid pusher. 3,944,472, Cl. 202-262.000.

Loyer, Phillip K.: *See—*
Heisner, Donald N.; Palermo, Anthony, Jr.; and Loyer, Phillip K., 3,944,831.

LTV Aerospace Corporation: *See—*
Musgrove, Robert G., 3,944,170.

Lubitzsch, Wolfgang, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Method and apparatus for the production of staple slivers from tows of filament fibers. 3,943,805, Cl. 83-23.000.

Lucas Electrical Company Limited, The: *See—*
Allport, Maurice James; and Williams, David Gordon, 3,944,905.
Moore, John Howard; and Cockshott, Charles Peter, 3,944,860.
Moore, John Howard; and Cockshott, Charles Peter, 3,944,861.
Thornley, Derek, 3,944,955.

Luckock, Glenn W.; and Warnick, William V., to PPG Industries, Inc. Glossy coating compositions from copolymers of vinylidene fluoride. 3,944,689, Cl. 427-385.000.

Luddy, Francis E.; Hampson, James W.; Herb, Samuel F.; and Rothbart, Herbert L., to United States of America, Agriculture. Multistep crystallization and blending process for making physiochemically designed fat compositions from tallow. 3,944,585, Cl. 260-428.500.

Luebkemann, Harry Paul E.; and Wood, David Bradford, III, to Cincinnati Milacron Inc. Multiple tool turret. 3,943,802, Cl. 82-2.00R.

Luhdorff, Dieter: *See—*
Lindemann, ; Weise, Lutz; and Luhdorff, Dieter, 3,944,291.

Luke, John A.; and Harrison, Raymond J., to Brown & Williamson Tobacco Corporation. Production of tobacco smoke filter rod. 3,943,835, Cl. 93-77.0FT.

Lummus Company, The: *See—*
Kwon, Joon Taek, 3,944,486.
Paustian, John E.; and Gelbein, Abraham P., 3,944,598.

Lundberg, George A., to E. J. Brooks Company. Seal. 3,944,269, Cl. 292-322.000.

Lundin, Lars Erik; and Vieglins, Dzintars Illmars, to Aktiebolaget Electrolux. Windshield wiper. 3,943,595, Cl. 15-250.230.

Lunt, Richard R.: *See—*
Field, Edwin L.; Lamantia, Charles R.; Lunt, Richard R.; Oberholtzer, James E.; and Valentine, James R., 3,944,649.

Lupton, John Madison; and Regester, James Williams, to Du Pont de Nemours, E. I., and Company. Exceptionally rigid and tough ultrahigh molecular weight linear polyethylene. 3,944,536, Cl. 260-94.90R.

Luteran, Frank Kenneth. Ignition system for rotary piston engine. 3,943,897, Cl. 123-8.090.

Luteran, Frank Kenneth. Liquid level shutoff control. 3,944,845, Cl. 307-118.000.

Luteran, Frank Kenneth. Device for sensing the direction of motion. 3,944,923, Cl. 324-165.000.

Lutsavs, Yan Yanovich: *See—*
Apsit, Voldemar Voldemarovich; Dombur, Lev Eduardovich; Lutsavs, Yan Yanovich; Pugachev, Vladislav Alexandrovich; Schukin, Mikhail Ivanovich; Dirzhis, Sauljus Antanovich; Karosas, Iozas Ionovich; Pashtukas, Algis Vladislavovich; and Khlavnovich, Leonid Borisovich, 3,944,863.

Lutz, George H. Element for heating system. 3,944,395, Cl. 29-183.500.

Lynch, David P., to General Electric Company. Vertical centering control circuit. 3,944,881, Cl. 315-398.000.

Lynch, Robert W., to Specialty Products Development Corporation. Gas generator for automobile driver restraint bag. 3,944,251, Cl. 280-150.0AB.

Lytle, John P.: *See—*
Bitonti, Paul A.; and Lytle, John P., 3,943,972.

Maag-Gear Wheel & Machine Company Limited: *See—*
Ruffner, Heinz, 3,943,633.

Mack-Chicago Corporation: *See—*
McCall, Richard J.; and Wolfe, Marvin, 3,944,129.

Maeda, Hiroaki: *See—*
Miyao, Takayuki; Maeda, Hiroaki; and Sato, Masanori, 3,943,715.

Magder, Jules, to Princeton Organics, Inc. Foamed lightweight ceramic compositions. 3,944,425, Cl. 106-40.00R.

Magdo, Ingrid E.; and Magdo, Steven, to International Business Machines Corporation. Method for fabrication of integrated circuit structure with full dielectric isolation utilizing selective oxidation. 3,944,447, Cl. 148-175.000.

Magdo, Steven: *See—*
Magdo, Ingrid E.; and Magdo, Steven, 3,944,447.

Maggos, Theodore: *See—*
Lindahl, Harold T.; and Maggos, Theodore, 3,943,673.

Maggs, Frederick Arthur Pomroy: *See—*
Simpson, Keith; and Maggs, Frederick Arthur Pomroy, 3,944,403.

Magnaflux Corporation: *See—*
Mlotfijalkowski, Adolf, 3,944,828.

Magnavox Company, The: *See—*
Borg, Arthur N.; and Smith, Bruce E., 3,945,003.

Magneville, Pierre: *See—*
Cholet, Jacques; Laurent, Jean; and Magneville, Pierre, 3,944,031.

Magyar Tudomanyos Akademia Kozponti Kemiai Kutato Intezet: *See—*
Nagy, Oszkar, 3,943,962.

Mahadevan, Parameswar: *See—*
Chuan, Raymond L.; Mahadevan, Parameswar; and Bergquist, Daryl J., 3,944,834.

Mahler, Walter, to Du Pont de Nemours, E. I., and Company. Stabilization of trichlorodifluoro benzenes. 3,944,494, Cl. 252-68.000.

Mai Van Duc, Duc: *See—*
Angel, Yves; and Mai Van Duc, Duc, 3,944,912.

Maier, Elmar; and Tilg, Robert, to Hilti Aktiengesellschaft. Fastening element holder strip with break-off locations. 3,944,068, Cl. 206-347.000.

Mairesse, Jean-Pierre: *See—*
Plumat, Emile; and Mairesse, Jean-Pierre, 3,944,713.

Maisch, Wolfgang; and Domann, Helmut, to Robert Bosch GmbH. Apparatus for the compensation of accelerations causing lateral deviation of a motor vehicle. 3,944,014, Cl. 180-79.100.

Maitra, Pradeep: *See—*
Corte, Ernesto; Maitra, Pradeep; and Franklin, Wesley Donald, 3,944,945.

Majkrzak, Charles Peter. Fluidic frequency generator. 3,943,884, Cl. 116-137.00R.

Major, Burney A.: *See—*
Urbanic, John M.; and Major, Burney A., 3,944,781.

Makarova, Natalia Nikolaevna: *See—*
Andrianov, Kuzma Andrianovich; and Makarova, Natalia Nikolaevna, 3,944,520.

Malinin, Anatoly Isidorovich: *See—*
Vainer, Shimon Abramovich; Temerev, Anatoly Fedorovich; Vainer, Savely Abramovich; Nikulin, Sergei Sergeevich; Kheifets, Matvei Evseevich; Usoltsev, Vadim Anatolievich; Matveev, Evgeny Fedorovich; Kazakov, Georgy Petrovich; Salkov, Vladimir Alexandrovich; and Malinin, Anatoly Isidorovich, 3,944,441.

Malleck, Joseph W.: *See—*
Whalen, Mark E.; Trepanier, Norman W.; Kraus, Robert A.; and Malleck, Joseph W., 3,943,617.

Manabe, Kenshi: *See—*
Suzuki, Yasoji; and Manabe, Kenshi, 3,945,000.

Manganaro, James L.; Cummins, Richard W.; and Olson, Raymond A., to FMC Corporation. Process for recovery of cyanuric acid from chlorinator mother liquor. 3,944,548, Cl. 260-248.00A.

Mann, Egon, to Zahnradfabrik Friedrichshafen AG. Drive mechanism for cement mixer and the like. 3,943,789, Cl. 74-417.000.

Mann, Egon: *See—*
Winter, August; Mann, Egon; and Meyerle, Michael, 3,944,010.

Manta: *See—*
Bogaert, Pierre Joseph, 3,943,866.

Manufacture D'Accumulateurs et D'Objets Moules: *See—*
Gaide, Rene, 3,944,436.

Maquinaria Textil Del Norte De Espana S.A.-Matesa: *See—*
Serrallonga Vilaseca, Hilario, 3,943,976.

Marchese, Robert T., to Westinghouse Electric Corporation. Reducing concentration of gases in nuclear reactor. 3,944,466, Cl. 176-37.000.

Marconi Company Limited, The: *See—*
Glasgow, John Arthur, 3,945,011.
Radford, Matthew Frederick, 3,945,007.
Wardrop, Brian, 3,945,010.

Marcoux, Leo: *See—*
Jenne, Richard L.; Marcoux, Leo; and Evans, Thomas E., 3,944,970.

Marini, Maresco: *See—*
Adembri, Giorgio; Tedeschi, Piero; Ponticelli, Fabio; and Marini, Maresco, 3,944,563.

Marlowe, Bernard; and Tannenbaum, Stanley, to Thiokol Corporation. Thixotropic monopropellant containing inorganic phosphides or phosphide alloys. 3,944,448, Cl. 149-22.000.

Marquart, Tom E.: *See—*
Cantwell, Robert R.; and Marquart, Tom E., 3,943,953.

Marquart, Tom Eugene; and Cantwell, Robert Roger, to Kellwood Company. Tent. 3,943,952, Cl. 135-1.00R.

Mars, Inc.: *See—*
van Zeggern, Wilhelm Aart, 3,944,038.

Marsden, James Glenn; and Orenski, Peter Joseph, to Union Carbide Corporation. Azido-silane compositions. 3,944,574, Cl. 260-349.000.

Marsh, Walter G.; and Rhoades, James J., to Tapco Products Company, Inc. Louver cutter. 3,943,744, Cl. 72-326.000.

Martin, David G.; and Hanka, Ladislav J., to Upjohn Company, The. αS, 4S, 5R α-Amino-3-chloro-4-hydroxy-2-isoxazoline-5-acetic acid. 3,944,562, Cl. 260-307.00F.

Martin, Fred W.: *See—*
Cutchins, Malcolm A.; Foster, Winfred A., Jr.; Orlin, Peter A.; Martin, Fred W.; and Burkhalter, John E., 3,944,137.

Martin, Gary E.: *See—*
Learmont, Tom; Nelmark, Jack D.; Martin, Gary E.; and Raske, Theodore F., 3,944,300.

Martin, Jay Robert, to Union Carbide Corporation. Radioactive krypton gas separation. 3,944,646, Cl. 423-219.000.

Martinez, Miguel, to Codman & Shurtleff, Inc. Photographic apparatus for slit lamp. 3,944,342, Cl. 351-14.000.

Martinson, Lennart Sune. Safety device. 3,944,255, Cl. 280-289.000.

Marulic, Walter J.: *See—*
Ferris, Ray L.; and Marulic, Walter J., 3,944,375.

Marzluff, William Frank: *See—*
Fetchin, John Allan; and Marzluff, William Frank, 3,944,609.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Erfurt, Horst-Lothar; Kreft, Holger; and Tronsberg, Walter, 3,943,867.
Kubis, Heribert; and Deschler, Gerhard, 3,943,908.

Maschinenfabrik & Eisebgiesserei Ed. Mezger AG: *See*—
Mezger, Fritz, 3,943,992.
Maschinenfabrik Fr. Niepmann & Co.: *See*—
Niepmann, Otto, 3,944,066.
Mashinenfabrik Reinhausen Gebruder Scheubeck K. G.: *See*—
Kugler, Kurt, 3,944,913.
Massay, Michel: *See*—
Ramont, Jacques P. A.; Jean, Andre C.; Puydebois, Leon M.; Rousse, Claude R.; and Massay, Michel, 3,943,856.
Masson, Jean-Jacques, to Compagnie Internationale Pour L'Informatique. Error syndrome and correction code forming devices. 3,944,973, Cl. 340-146.1AL.
Master Lock Company: *See*—
Foote, Daniel J., 3,943,738.
Masuda, Naosuke; and Yanagawa, Itiro, to Jidosha Kiki Co., Ltd. Combined load-sensing proportion and relay valve for an air brake system. 3,944,294, Cl. 303-40.000.
Matelena, John J. Pipeline for transporting petroleum products through tundra. 3,943,965, Cl. 137-340.000.
Mathews, Carl Fraser; Deverell, Christopher; Pears, Gordon Edmund Alfred; and Knowles, Peter George, to Imperial Chemical Industries Limited. Opaque molecularly oriented and heat set linear polyester film and process for making same. 3,944,699, Cl. 428-220.000.
Matkan, Josef, to Research Laboratories of Australia. Apparatus for transporting and charging paper in electrostatic copiers and the like. 3,944,355, Cl. 355-3.00R.
Matsson, Bo: *See*—
Dahlqvist, Jan; Matsson, Bo; and Johansson, Benny, 3,944,730.
Matsuda, Hisashi, to Nihon Denshi Kabushiki Kaisha. Virtual image type double focusing mass spectrometer. 3,944,827, Cl. 250-298.000.
Matsui, Kenji: *See*—
Hayashi, Yoshihiro; and Matsui, Kenji, 3,944,163.
Matsukawa, Hiroharu; Saeki, Keiso; and Shimada, Takeo, to Fuji Photo Film Co., Ltd. Process for preparing microcapsules containing hydrophobic oil drops. 3,944,502, Cl. 252-316.000.
Matsumoto, Keizo: *See*—
Ishibe, Shuhei; Okumichi, Toshiharu; and Matsumoto, Keizo, 3,944,532.
Matsumura, Hajime: *See*—
Ishida, Yotsuo; Okazaki, Takeo; Matsumura, Hajime; Menju, Shinichi; and Ohshima, Iwao, 3,944,886.
Matsumura, Masaji: *See*—
Koyanagi, Haruo; Takahashi, Masayoshi; Yamauchi, Nobuharu; Matsumura, Masaji; and Morimoto, Katsuhide, 3,944,987.
Matsuo, Yoshio, to Nippon Electric Company, Ltd. Monitor for a receiver having means for specifying regions within discrimination domains of a signal space. 3,944,929, Cl. 325-363.000.
Matsuoka, Sadao; Takeshita, Takashi; Tadokoro, Tomoo; and Nakao, Masami, to Toyo Kogyo Co., Ltd. Atmospheric pressure compensating means for an engine intake system. 3,943,899, Cl. 123-119.0DB.
Matsushita Electric Industrial Co., Ltd.: *See*—
Fujisawa, Seiji; and Michioka, Toru, 3,944,937.
Ohtani, Tadoa; Kato, Nobuyuki; Kojima, Shigeru; Sakamoto, Yoichi; Tsukahara, Masaharu; Kojima, Kiyoshi; Konno, Isago; and Kubo, Takao, 3,944,445.
Saito, Koetsu; Yano, Tsutomu; and Watanabe, Akinori, 3,944,335.
Teshima, Haruto; and Inui, Toshiaki, 3,943,813.
Yano, Tsutomu; and Watanabe, Akinori, 3,944,334.
Yoshii, Tetsuji, 3,945,039.
Matsushita, Takao: *See*—
Fujioka, Hironari; Matsushita, Takao; and Higaki, Taiji, 3,944,705.
Matsuzawa, Isamu: *See*—
Otsuki, Hiroshi; Sakuma, Kenzo; and Matsuzawa, Isamu, 3,944,565.
Matveev, Evgeny Fedorovich: *See*—
Vainer, Shimon Abramovich; Temerev, Anatoly Fedorovich; Vainer, Savely Abramovich; Nikulin, Sergei Sergeevich; Kheifets, Matvei Evseevich; Usoltsev, Vadim Anatolievich; Matveev, Evgeny Fedorovich; Kazakov, Georgy Petrovich; Salkov, Vladimir Alexandrovich; and Malinin, Anatoly Isidorovich, 3,944,441.
Matyasi, Jozsef: *See*—
Solymar, Karoly; Zambo, Janos; Orban nee Kelemen, Marika; Bujdoso, Erno; Feher, Ivan; Ozvald, Zoltan; Voros, Istvan; Ferenczi, Tibor; Toth, Pal; Lazar, Ferenc; Pinter, Tihamer; Sigmond, Gyorgy; Siklosi, Peter; Wentzely, Kalman; Lengyel, Laszlo; and Matyasi, Jozsef, 3,944,648.
Maudlin, Wendell E., to Borg-Warner Corporation. Air-cooled condenser apparatus. 3,943,728, Cl. 62-507.000.
Maury, Andre: *See*—
Aubert, Gilles; Lemoine, Roger; Maury, Andre; Moulin, Maurice; and Tomachevsky, Erik, 3,943,756.
Max Kabushiki Kaisha: *See*—
Hosaka, Hideo, 3,943,660.
Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See*—
Tacke, Maurus; and Ulrich, Reinhard, 3,944,326.
May, Robert H.: *See*—
Kallestad, Steven B.; and May, Robert H., 3,943,924.
Mayco Equipment Co., Inc.: *See*—
Evans, Michael J., 3,944,185.
Mayer, Jean Jacques, to Compagnie Internationale Pour L'Informatique - C.I.I. Image-display system interacting with light pen. 3,944,988, Cl. 340-172.500.
Maynard, Michael, to Gestetner Limited. Core holder for stencil or ink screen. 3,943,850, Cl. 101-127.100.
MCA Discovision, Inc.: *See*—
Elliott, James E., 3,944,727.
McCall, Richard J.; and Wolfe, Marvin, to Mack-Chicago Corporation. Corrugated shipping tray with air space surroundings. 3,944,129, Cl. 229-32.000.
McCarter, Michael K.; and Green, Dale J., to Kennecott Copper Corporation. Telemetry alarm system. 3,944,996, Cl. 340-282.000.
McClintock, William A.; and Proctor, Oliver P., to Phillips Petroleum Company. Apparatus suitable for carrying out catalytic process. 3,944,394, Cl. 23-288.00K.
McClocklin, Samuel B.: *See*—
Steinberg, Richard W.; McClocklin, Samuel B.; and Kostelecky, Clarence L., 3,943,843.
McCole, Thomas P.: *See*—
Dennis, John J., Jr.; and McCole, Thomas P., 3,944,701.
McCombs, Frank Paul: *See*—
Foley, Kevin M.; McCombs, Frank Paul; and Bell, Reuben H., 3,944,515.
McCown, Joseph Dana, to Minnesota Mining and Manufacturing Company. Fluoroaliphatic copolymers. 3,944,527, Cl. 260-79.700.
McCoy, Ernest H.: *See*—
Carothers, Paul A., 3,943,677.
McCracken, Howard B.: *See*—
Acks, Robert S.; Watson, Stanley J.; and McCracken, Howard B., 3,944,967.
McCrady, John: *See*—
Kilby, Jack S.; Schweitzer, Robert F.; and McCrady, John, 3,944,724.
McDermott, Hugh L. Rotary fluid displacement apparatus with orbiting toothed ring member. 3,944,378, Cl. 418-60.000.
McDonald, Bernard. Midstream urine specimen collection device. 3,943,770, Cl. 73-421.00R.
McDonald, Thomas Michael; and Muchnick, Paul. Circuit for verifying correct connections to a three-wire dual voltage power distribution system and the absence of open circuit conditions therein. 3,944,891, Cl. 317-48.000.
McInerny, George P., to Pennsylvania Research Associates, Inc. Ticket counter and endorser. 3,944,210, Cl. 271-4.000.
McKeown, James E.; and Michel, Donald E., to Bendix Corporation, The. Bifurcated electrical contact. 3,944,313, Cl. 339-75.0MP.
McKibben, Richard K., to Sweco, Inc. Vibratory mill structure. 3,943,668, Cl. 51-163.00V.
McKinley, John R.: *See*—
Stewart, Robert D.; and McKinley, John R., 3,944,653.
McLaughlin, Jack E., to Andermac, Inc. Probe collector for subterranean gases. 3,943,750, Cl. 73-23.000.
McLintic, William James, to Thorn Electrical Industries Limited. Cold-light mirror. 3,944,320, Cl. 350-1.000.
McQueary, Agnes R., to Procter & Gamble Company, The. Article for conditioning fabrics in a clothes dryer. 3,944,694, Cl. 428-131.000.
McRay, Ferris L., to Fiat-Allis Construction Machinery, Inc. Fluid control system for hydraulically operated transmissions and master clutch. 3,944,035, Cl. 192-3.570.
Mead, Ralph T.; Greatbatch, Wilson; and Rudolph, Frank W., to Greatbatch, Wilson. Lithium iodine battery having improved energy density. 3,944,433, Cl. 136-83.00R.
Means, John A., to International Paper Company. Forming section for twin-wire papermaking machine. 3,944,464, Cl. 162-273.000.
Means, Richard E.: *See*—
Cartwright, William F.; Means, Richard E.; and Kallianos, Andrew G., 3,943,943.
Meckler, Gershon: *See*—
Lindahl, Harold T.; and Maggos, Theodore, 3,943,673.
Mecklin, Charles D.; and Robinson, Edward L., Jr., to International Harvester Company. Replaceable feeder fingers for a baler. 3,943,845, Cl. 100-189.000.
Medovar, Boris Izrailevich: *See*—
Shtanko, Jury Pavlovich; Baglai, Vitaly Mikhailovich; Medovar, Boris Izrailevich; Stupak, Leonid Mikhailovich; Pavliichuk, Georgy Anatolievich; and Bogachenko, Alexei Georgievich, 3,944,714.
Medtronic, Inc.: *See*—
King, Wendell L.; and Stokes, Kenneth B., 3,943,937.
Meeks, John K.: *See*—
Holt, James W.; and Meeks, John K., 3,943,967.
Meier, Jean: *See*—
Farthouat, Anne; and Meier, Jean, 3,944,555.
Meisner, Alfred; Oellig, Oskar; Neubauer, Josef; and Kratz, Bernhard, to Diehl. Setting mechanism for digital display devices. 3,944,795, Cl. 235-144.0ME.
Menashi, Wilson P.: *See*—
Haggerty, John S.; Menashi, Wilson P.; and Wenckus, Joseph F., 3,944,640.
Menju, Shinichi: *See*—
Ishida, Yotsuo; Okazaki, Takeo; Matsumura, Hajime; Menju, Shinichi; and Ohshima, Iwao, 3,944,886.
Merck & Co., Inc.: *See*—
Tull, Roger J.; Czaja, Robert F.; Shuman, Richard F.; and Pines, Seemon H., 3,944,600.
Wasson, Burton K.; and Williams, Haydn W. R., 3,944,560.
Mess, Richard C., to Dayton Sure-Grip & Shore Company, The. Split bolt. 3,943,817, Cl. 85-1.00S.
Messerschmitt-Bolkow-Blohm GmbH: *See*—
Grafwallner, Franz; and Schutz, Manfred, 3,943,706.

Molter, Gunther; and Schubert, Christoph, 3,944,087.

Messerschmitt, David Gavin: *See—*
Duttweiler, Donald Lars; and Messerschmitt, David Gavin, 3,945,002.

Metallgesellschaft Aktiengesellschaft: *See—*
Dorr, Karl-Heinz; Grimm, Hugo; Sander, Ulrich; Peichl, Robert; and Tacke, Michael, 3,944,401.

Metcalfe, Arthur G.; and Rose, Fred K., to International Harvester Company. Isothermal metal forming. 3,944,782, Cl. 219-152.000.

Metro Data Corporation: *See—*
Dalke, James A.; and Hough, Wayne E., 3,944,993.

Meyer, Engelbert A., to USM Corporation. Adapter for attaching molding or the like. 3,943,610, Cl. 24-73.0HS.

Meyer, James A., to Brunswick Corporation. Marine outboard gear assembly. 3,943,790, Cl. 74-417.000.

Meyerle, Michael: *See—*
Winter, August; Mann, Egon; and Meyerle, Michael, 3,944,010.

Meyers, William Foulks; and Savinov, Oleg Serge, to Savco, Inc. System and method for generation and distribution of electrical and thermal energy and automatic control apparatus suitable for use therein. 3,944,837, Cl. 290-40.00R.

Mezger, Fritz, to Maschinenfabrik & Eisebgiesserei Ed. Mezger AG. Controlled-pouring apparatus for metal casting. 3,943,992, Cl. 164-156.000.

Michaelis, Jack H.: *See—*
Young, Raymond R.; and Michaelis, Jack H., 3,944,374.

Michaels, Alan S.: *See—*
Bashaw, John D.; Zaffaroni, Alejandro; and Michaels, Alan S., 3,944,064.

Michel, Donald E.: *See—*
McKeown, James E.; and Michel, Donald E., 3,944,313.

Michioka, Toru: *See—*
Fujisawa, Seiji; and Michioka, Toru, 3,944,937.

Microlab/FXR: *See—*
Augenblick, Harry A.; and Keller, Richard, 3,944,928.

Midland-Ross Corporation: *See—*
Fathauer, Jack E., 3,944,272.

Midwinter, John Edwin, to Post Office, The. Dielectric waveguides. 3,944,811, Cl. 250-199.000.

Mihara, Sirou: *See—*
Osajima, Yoshihiro; Imao, Syoji; Shinomiya, Tokuo; Mihara, Sirou; and Edamatsu, Michisuke, 3,944,639.

Milbrada, Edward John: *See—*
Diehl, Francis Louvaine; Zeffren, Eugene; and Milbrada, Edward John, 3,944,470.

Milgram, Jerome H., to Offshore Devices, Inc. Floating oil barrier. 3,943,720, Cl. 61-1.00F.

Miller, Alexander, Jr.; and Morales, Juan G., to Shell Oil Company. Non-volatile slow-release pesticidal generators. 3,944,662, Cl. 424-78.000.

Miller, Daniel C. Trailer jacking device. 3,944,259, Cl. 280-475.000.

Miller, George W. Mustache cup adaptor. 3,944,112, Cl. 220-90.200.

Miller, James R., to Minnesota Mining and Manufacturing Company. Channeling wedge. 3,944,183, Cl. 254-104.000.

Miller, John H., to Lawrence Peska Associates, Inc. Solar cooling system for an automobile. 3,943,726, Cl. 62-2.000.

Miller, Milton J. Anchor system for mobile homes and similar structures. 3,943,670, Cl. 52-23.000.

Mills, Loring K., to Polaroid Corporation. Photographic film processing apparatus having disengagement means. 3,943,786, Cl. 74-384.000.

Milwaukee Resistor Corporation: *See—*
Francis, Ralph M., Jr., 3,944,934.

Minami, Isao. Method of removing nicotine in smoking and a smoking filter to be used therefor. 3,943,940, Cl. 131-10.100.

Minck, Klaus: *See—*
Bauer, Adolf; Weber, Karl Heinz; Minck, Klaus; and Danneberg, Peter, 3,944,579.

Ming, Joseph W. Tree climbing stand. 3,944,022, Cl. 182-20.000.

Mink, Alan E.; and Mitchell, Darrell D., to Dow Corning Corporation. Curable organopolysiloxane compositions. 3,944,519, Cl. 260-46.5UA.

Minner, Willy, to Licentia Patent-Verwaltungs-GmbH. Ring counter circuit with electronic switch control of clock pulse transmission. 3,944,851, Cl. 307-223.00R.

Minnesota Mining and Manufacturing Company: *See—*
Bent, John H., 3,943,934.
Gobran, Ramsis, 3,944,523.
Johnson, James William, 3,944,738.
McCown, Joseph Dana, 3,944,527.
Miller, James R., 3,944,183.
Podvin, Richard T.; and Look, Thomas F., 3,944,457.

Misawa, Akira: *See—*
Tsunoda, Ichiro; Takeuchi, Satoshi; Hirao, Yoichiro; Suzuki, Takeo; Nishiue, Yoshihiro; Tadokoro, Katsumasa; Fukagawa, Toshimasa; Harada, Isamu; Misawa, Akira; and Watanabe, Kazuo, 3,944,330.

Misulovin, Leonid Yakovlevich; Panin, Igor Ivanovich; Soloveichik, Yakov Girshevich; Kovalev, Leonid Anisimovich; and Zhoglo, Viktor Olimpievich, to Corning Glass Works. Magnetically controlled switching matrix. 3,944,956, Cl. 335-112.000.

Mita Industrial Company Limited: *See—*
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,944,422.

Mitchell, Bruce R.; and Swift, Harold E., to Gulf Research & Development Company. Process for the cracking of high metals content feedstocks. 3,944,482, Cl. 208-120.000.

Mitchell, Darrell D.: *See—*
Mink, Alan E.; and Mitchell, Darrell D., 3,944,519.

Mitchell, Robert: *See—*
Colodney, Daniel; Steinke, John J.; and Mitchell, Robert, 3,944,661.

Mitchell, Robert W., to Photo Systems, Inc. Focusing device and method of use thereof for photographic enlarger. 3,944,363, Cl. 355-60.000.

Mitsubishi Chemical Industries, Ltd.: *See—*
Suzuki, Yoshiaki; Mori, Hajime; and Nakanome, Takemi, 3,944,628.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Ito, Shuji, 3,944,726.
Koyanagi, Haruo; Takahashi, Masayoshi; Yamauchi, Nobuharu; Matsumura, Masaji; and Morimoto, Katsuhide, 3,944,987.
Kuji, Yoichi; Kato, Tuyoshi; and Saito, Nagao, 3,944,478.

Mitsubishi Kakoki Kaisha Ltd.: *See—*
Hirota, Ryuichi; Kakuta, Hisashi; Motoba, Shigetado; Shimizu, Kenichi; Kanno, Ryoichi; and Narita, Mitsuaki, 3,944,650.

Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Yanagida, Tokio; Saito, Ariyoshi; Hosoda, Naoyuki; and Kaneko, Fukuzo, 3,944,414.

Mitsubishi Petrochemical Company Limited: *See—*
Sennari, Mutsuo; Izumi, Yoichiro; and Fujita, Taketoshi, 3,944,534.

Mitsubishi Rayon Co., Ltd.: *See—*
Ide, Fumio; Kishida, Kazuo; Deguchi, Seiji; and Kaneda, Masahiro, 3,944,630.
Osajima, Yoshihiro; Imao, Syoji; Shinomiya, Tokuo; Mihara, Sirou; and Edamatsu, Michisuke, 3,944,639.

Mitsui Mining & Smelting Co., Ltd.: *See—*
Kobayashi, Takeshi; and Tanaka, Yoshiharu, 3,944,995.

Mitsui Toatsu Chemicals, Inc.: *See—*
Inoue, Shigeru; and Kimura, Tetsuo, 3,944,605.
Sugita, Yasunori; and Itagaki, Yasuhiko, 3,944,530.

Miya, Masami; Nagasaki, Masao; and Harada, Shuichi, to Nepon Kabushiki Kaisha (Nepon Inc.). Method and apparatus for deodorizing the dipping up system of a lavatory. 3,943,578, Cl. 4-128.000.

Miyachi, Tatsuro, to Beltek Corporation. Citizens band transceiver assembly for mounting on a motorcycle. 3,944,924, Cl. 325-16.000.

Miyahara, Masato: *See—*
Grenfell, James W.; Sorenson, Fred M.; Ueno, Hiroshi; and Miyahara, Masato, 3,943,914.

Miyao, Takayuki; Maeda, Hiroaki; and Sato, Masanori, to Aisin Seiki Kabushiki Kaisha. Servo mechanism. 3,943,715, Cl. 60-431.000.

Miyatsuka, Hajime; Honjo, Satoru; Sawada, Kenichi; and Saida, Takashi, to Rank Xerox, Ltd. Method of providing an electrophotographic coating and compositions for the method. 3,944,682, Cl. 427-74.000.

Mizon, Eric; and Moores, Hugh, to Platt International Limited. Open-end spinning apparatus. 3,943,691, Cl. 57-58.890.

Mizuhara, Yasushi; Abe, Tsuwao; and Hitomi, Hiroyuki, to Hitachi Seiko Ltd. Electrolytic grinding method. 3,944,475, Cl. 204-129.460.

Mizutani, Kazunori; Kitaura, Toshihiko; and Noo, Minoru, to Nitto Electric Industrial Co., Ltd. Hollow cavity package electronic unit. 3,943,623, Cl. 29-588.000.

Mlotfijalkowski, Adolf, to Magnaflux Corporation. Hydrophobic powdered developer for fluorescent penetrant inspection. 3,944,828, Cl. 250-302.000.

Mo och Domsjo Aktiebolag: *See—*
Samuelson, Hans Olof; Smedman, Leif Ake; and Hagglund, Erik Olof Sture, 3,944,463.

Moatti, Samuel Georges. Self-cleaning filter with motor incorporated therewith. 3,944,488, Cl. 210-108.000.

Mobil Oil Corporation: *See—*
Horodysky, Andrew G.; and Allen, Paul T., 3,944,539.
Whitehurst, Darrell D.; Butter, Stephen A.; and Rodewald, Paul G., 3,944,501.

Model, Ernst; von der Crone, Jost; and Pugin, Andre, to Ciba-Geigy Corporation. Iminoisoindolinone pigments. 3,944,547, Cl. 260-248.0CS.

Modi, Bhogilal M.: *See—*
Reehil, Edward G.; Summers, James E.; and Modi, Bhogilal M., 3,944,794.

Modicon Corporation: *See—*
Morley, Richard E.; and Greenberg, Michael P., 3,944,984.

Moe, James E.; Peel, Richard V.; and Smith, Richard E., to Saftran System Corporation. Railroad crossing motion sensing system. 3,944,173, Cl. 246-34.0CT.

Moebs, Heinz: *See—*
Kunert, Heinz; Moebs, Heinz; and Sauer, Gerd, 3,945,014.

Moffat, Jon L. Percent calculator. 3,944,789, Cl. 235-78.00M.

Mogi, Takao; and Okada, Hisao, to Sony Corporation. Remote control system for electric apparatus. 3,944,982, Cl. 340-171.00R.

Mogi, Takao: *See—*
Shiota, Takizo; and Mogi, Takao, 3,943,881.

Molins Limited: *See—*
Doerman, Eryk Stefan; and Hirsh, Ivan Yehudi, 3,943,752.

Molter, Gunther; and Schubert, Christoph, to Messerschmitt-Bolkow-Blohm GmbH. On-board freight loading device for aircrafts. 3,944,087, Cl. 214-75.00R.

Molzon, William R., to Rohr Industries, Inc. Wall mounted side facing seat for transit vehicle. 3,944,283, Cl. 297-454.000.

Mombers, Wilhelmus L. R., to L. Mombers B.V. Method of manufacturing polyamide coated textile material and to the textile material made according to the method. 3,944,700, Cl. 428-260.000.

Momiyama, Kikuo, to Canon Kabushiki Kaisha. Large aperture photographic objective. 3,944,339, Cl. 350-220.000.

Monadnock Lifetime Products, Inc.: *See—*
Starrett, Paul D., 3,944,226.

Mong, William K.; and Temple, Fred, to Westinghouse Air Brake Company. Pipe bracket. 3,944,264, Cl. 285-137.00R.

Monsanto Company: *See—*
Hedrick, Ross Melvin; and Gabbert, James D., 3,944,629.
Hershman, Arnold; and Forster, Denis, 3,944,604.
Iqbal, Abul F. M., 3,944,615.
Kerst, Al F., 3,944,599.
Morris, Donald E., 3,944,603.
Schierding, Royce Gene; Young, John Russell, Jr.; and Vadnais, David Louis, 3,944,393.

Montana, Richard L., to Digital Computer Controls, Inc. Method and apparatus for automatic sales tax computation. 3,944,801, Cl. 235-156.000.

Montedison S.p.A.: *See—*
Caporiccio, Gerardo; and Carniselli, Giuliano, 3,944,610.

Montgomery, Ronald Eugene; and Incho, Harry Hobart, to FMC Corporation. Insecticidal compositions and methods of combatting insects using 3-phenoxybenzyl 2,2-dimethyl-3-(2,2-dichlorovinyl)-cyclopropanecarboxylate insecticide with a synergistic compound of mono (alkyl and alkenyl)mono omega-alkynyl arylphosphonates. 3,944,666, Cl. 424-219.000.

Mookherjee, Braja Dulal; Kamath, Venkatesh; and Shuster, Edward J., to International Flavors & Fragrances Inc. Pi-tricyclene derivatives and process for preparing pi-tricyclene derivatives. 3,944,621, Cl. 260-586.00G.

Moonan, William; and Czarnecki, John D., to Sherwin-Williams Company, The. Container and lid structure. 3,944,115, Cl. 220-355.000.

Moore, Alvin Edward. Insulated, tube-framed, land-traversing vehicle. 3,944,008, Cl. 180-21.000.

Moore, Arthur H., to Bridgeport Metal Goods Manufacturing Company, The. Wireless electric swivel head hand lantern. 3,944,805, Cl. 240-10.610.

Moore, John Howard; and Cockshott, Charles Peter, to Lucas Electrical Company Limited, The. Radiation-sensitive switching circuits. 3,944,860, Cl. 307-311.000.

Moore, John Howard; and Cockshott, Charles Peter, to Lucas Electrical Company Limited, The. Radiation-sensitive switching circuits. 3,944,861, Cl. 307-311.000.

Moore, John Richard, to International Computers Limited. Colour display apparatus. 3,944,999, Cl. 340-324.0AD.

Moore, Ronald W.: *See—*
Redman, Charles M.; and Moore, Ronald W., 3,944,948.

Moore, William Cooper; Kiss, John David; and Dean, John Richard, to International Telephone & Telegraph Corporation. Luminaire with mounting means. 3,944,809, Cl. 240-73.00R.

Moore, William J. Balance beam training apparatus. 3,944,654, Cl. 272-60.00R.

Moores, Hugh: *See—*
Mizon, Eric; and Moores, Hugh, 3,943,691.

Morales, Juan G.: *See—*
Miller, Alexander, Jr.; and Morales, Juan G., 3,944,662.

Moreno, Victor: *See—*
Friedman, Herman H.; and Moreno, Victor, 3,944,681.

Morgan, David W., to Corning Glass Works. Heat absorbing glasses. 3,944,352, Cl. 353-55.000.

Morgand, Pierre; and Riou, Yves, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Telephone private branch exchange system. 3,944,751, Cl. 179-27.0CA.

Morhart, Rudolf: *See—*
Kummel, Louis; Morhart, Rudolf; and Pollak-Banda, Erich, 3,943,788.

Mori, Hajime: *See—*
Suzuki, Yoshiaki; Mori, Hajime; and Nakanome, Takemi, 3,944,628.

Morimoto, Katsuhide: *See—*
Koyanagi, Haruo; Takahashi, Masayoshi; Yamauchi, Nobuharu; Matsumura, Masaji; and Morimoto, Katsuhide, 3,944,987.

Morisaki, Kazuo; and Watanabe, Mikio, to Sakai Sen-i Kogyo Kabushiki Kaisha; and Hokuriku Kakoki Kabushiki Kaisha. Method of preparing purifying agents consisting of activated siliceous porous mineral substances. 3,944,687, Cl. 427-372.000.

Morishita, Isao: *See—*
Takahara, Hiroyasu; Morishita, Isao; Shiga, Mikio; and Uchijima, Toshikatsu, 3,944,679.

Morley, Richard E.; and Greenberg, Michael P., to Modicon Corporation. Computer controller system with a reprogrammable read only memory. 3,944,984, Cl. 340-172.500.

Morlock, Waldemar: *See—*
Eitel, Hans-Georg; Morlock, Waldemar; and Ruf, Dieter, 3,943,746.

Morris, Donald E., to Monsanto Company. Production of propionic acid. 3,944,603, Cl. 260-533.0AN.

Morris, Halsted: *See—*
Teague, Walter Dorwin, Jr., 3,944,237.

Morris, James Reed, IV: *See—*
Teague, Walter Dorwin, Jr., 3,944,237.

Morris, Katrina: *See—*
Teague, Walter Dorwin, Jr., 3,944,237.

Morris, Mary Carroll Sinclaire: *See—*
Teague, Walter Dorwin, Jr., 3,944,237.

Morrison, Wilbur J.: *See—*
Fallos, George; and Morrison, Wilbur J., 3,944,213.

Morton-Norwich Products, Inc.: *See—*
Schwan, Thomas J., 3,944,581.

Mosser, John Darwin: *See—*
Levin, Ezra; and Mosser, John Darwin, 3,944,655.

Motoba, Shigetado: *See—*
Hirota, Ryuichi; Kakuta, Hisashi; Motoba, Shigetado; Shimizu, Kenichi; Kanno, Ryoichi; and Narita, Mitsuaki, 3,944,650.

Motor Finance Corporation: *See—*
Gilbert, Roswell W., 3,944,852.

Motorola, Inc.: *See—*
Daniels, R. Gary, 3,943,699.
De Laune, Jon M., 3,944,925.
Severson, Gerald R., 3,943,915.

Mott, Richard H.; and Erlenbusch, Gary L., to Du-Al Manufacturing Company. Bale handling device. 3,944,274, Cl. 294-88.000.

Moulin, Maurice: *See—*
Aubert, Gilles; Lemoine, Roger; Maury, Andre; Moulin, Maurice; and Tomachevsky, Erik, 3,943,756.

Moyle, Clarence L., to Dow Chemical Company, The. Germicidal detergent containing a thienyliodonium salt. 3,944,498, Cl. 252-106.000.

Mrozek, John W.: *See—*
Fisher, Howard M.; Albers, Bernd G.; and Mrozek, John W., 3,944,083.

Muchnick, Paul: *See—*
McDonald, Thomas Michael; and Muchnick, Paul, 3,944,891.

Mudrak, Anton: *See—*
Burt, Gerald D.; and Mudrak, Anton, 3,944,540.

Mueller, Floyd F., to American Hospital Supply Corporation. Adjusting mechanism for stirrup extension bar for medical examination table. 3,944,205, Cl. 269-328.000.

Mueller, Hans W.; and Lamey, Cornel L., to SCM Corporation. Changeable type. 3,944,041, Cl. 197-36.000.

Mueller, Werner, Jr., to Codman & Shurtleff, Inc. Light inclining accessory for slit lamp. 3,944,343, Cl. 351-16.000.

Mullen, Edward J.: *See—*
Donnelly, Thomas L.; and Mullen, Edward J., 3,944,783.

Muller, Hans Rudolf: *See—*
Bateman, Charles D.; and Muller, Hans Rudolf, 3,944,968.

Multiscreen Corporation Limited: *See—*
Jones, Peter Ronald Wright, 3,944,349.

Mumma, Harold J., to FMC Corporation. Selective reject mechanism for discharging fruit or the like from a conveyor. 3,944,047, Cl. 198-25.000.

Munro, David Farnham: *See—*
Cuthbert, John David; Fehrs, Delmer Lee; and Munro, David Farnham, 3,944,369.

Murakami, Hiroshi, to Nippon Electric Company, Ltd. Magnetic domain memory organization. 3,944,991, Cl. 340-174.0TF.

Murakoshi, Makoto: *See—*
Suwama, Toshitaka; and Murakoshi, Makoto, 3,945,018.

Murase, Kenji; and Andoh, Shizuo, to Fujitsu Limited. Coordinate position information output device. 3,944,740, Cl. 178-18.000.

Murata, Yoshio: *See—*
Ito, Shuji, 3,944,726.

Murley, Ellsworth M., Jr., to Owens-Illinois, Inc. Solid state multiphase high voltage generator. 3,944,874, Cl. 315-169.0TV.

Musgrove, Robert G., to LTV Aerospace Corporation. Apparatus for producing pivotal movement. 3,944,170, Cl. 244-44.000.

Muylle, Wilfried Edgard, to AGFA-GEVAERT N.V. Rotary perforating apparatus. 3,943,810, Cl. 83-337.000.

Myers, John L., to Projects Unlimited, Inc. High efficiency buzzer. 3,945,004, Cl. 340-384.00E.

Nack, Michael R.: *See—*
Crawford, Donald C.; and Nack, Michael R., 3,943,686.

Nadelson, Jeffrey: *See—*
Houlihan, William J.; and Nadelson, Jeffrey, 3,944,570.

Naegeli, Lloyd. Vibrating receiving device for folding punch tape. 3,944,208, Cl. 270-61.00F.

Nagai, Yohei; and Wachi, Masatada, to Nippon Gakki Seizo Kabushiki Kaisha. Touch responsive sensor in electronic keyboard musical instrument. 3,943,812, Cl. 84-1.100.

Nagara, Hiroaki: *See—*
Doi, Kaname; and Nagara, Hiroaki, 3,944,292.

Nagasaki, Masao: *See—*
Miya, Masami; Nagasaki, Masao; and Harada, Shuichi, 3,943,578.

Nagase, Minoru, to Nippon Air Brake Company, Ltd., The. Electropneumatic brake apparatus for railway vehicles. 3,944,287, Cl. 303-15.000.

Nagashima, Kazuo, to Toshiba Kikai Kabushiki Kaisha. Apparatus for profile grinding closed curved surface. 3,943,665, Cl. 51-101.00R.

Nagumo, Shin-ichi; Nakajima, Yasuo; Hayashi, Yoshimasa; and Sugihara, Kunihiko, to Nissan Motor Company Limited. Multi-stage air pump for supplying secondary air into an exhaust gas purification system. 3,943,711, Cl. 60-301.000.

Nagy, Oszkar, to Magyar Tudomanyos Akademia Kozponti Kemiai Kutato Intezet. Universal equipment for connecting pipe line favourably for adjusting variable angles. 3,943,962, Cl. 137-270.000.

Nakajima, Yasuo: *See—*
Nagumo, Shin-ichi; Nakajima, Yasuo; Hayashi, Yoshimasa; and Sugihara, Kunihiko, 3,943,711.
Nakakubo, Tamio: *See—*
Tsubaki, Yousuke; and Nakakubo, Tamio, 3,943,893.
Nakamoto, Soichi: *See—*
Hasegawa, Goro; Nakamoto, Soichi; Watanabe, Yoshiaki; Taguchi, Tetsuya; and Yamada, Katuhiko, 3,945,024.
Nakamura, Tsugio, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Article of furniture formed by interconnected structural bodies. 3,944,282, Cl. 297-440.000.
Nakano, Seizo: *See—*
Kishi, Tuneo; and Nakano, Seizo, 3,943,777.
Nakanome, Takemi: *See—*
Suzuki, Yoshiaki; Mori, Hajime; and Nakanome, Takemi, 3,944,628.
Nakao, Masami: *See—*
Matsuoka, Sadao; Takeshita, Takashi; Tadokoro, Tomoo; and Nakao, Masami, 3,943,899.
Nakayama, Takeo. Medical treatment apparatus. 3,943,912, Cl. 128-1.300.
Naramoto, Isao; Kyuma, Tatsuo; and Akazome, Giichi, to New Japan Chemical Company, Limited. Process for preparing diphenylamine from aniline. 3,944,613, Cl. 260-576.000.
Narita, Mitsuaki: *See—*
Hirota, Ryuichi; Kakuta, Hisashi; Motoba, Shigetado; Shimizu, Kenichi; Kanno, Ryoichi; and Narita, Mitsuaki, 3,944,650.
Nash, Dudley O., to General Electric Company. Gas turbine engine exhaust nozzle diverter valve. 3,943,707, Cl. 60-229.000.
National Research Development Corporation: *See—*
Hilsum, Cyril; Johnson, Frederick Alistair; and Raynes, Edward Peter, 3,944,817.
National Sanitation Services, Ltd.: *See—*
Syrenne, Marius H., 3,943,960.
National Starch and Chemical Corporation: *See—*
Schoenberg, Jules E.; and Ray-Chaudhuri, Dilip K., 3,944,428.
NCR Corporation: *See—*
Janning, John L., 3,944,331.
Rasmussen, Donald C.; and Funkhouser, Richard L., 3,944,211.
Thur, Gerry W.; and DeGraff, Peter H., 3,943,950.
Neal, John A., to Georgia-Pacific Corporation. Separation of mannitol from galactitol. 3,944,625, Cl. 260-637.00R.
Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzook ten behoeve van de Volksgezondheid: *See—*
van Calsteren, Francois Adriaan; and Hiestand, Willem Pieter, 3,944,405.
Nee, Paul, to Pelleray, Roger. Method and a machine for the automatic manufacture of pressurized or liquefied gas tanks. 3,943,615, Cl. 29-33.00P.
Neilson, William J., to Smith International, Inc. Rock bit bearing seal. 3,944,306, Cl. 308-187.100.
Nelmark, Jack D.: *See—*
Learmont, Tom; Nelmark, Jack D.; Martin, Gary E.; and Raske, Theodore F., 3,944,300.
Nelson, Kyler F.: *See—*
Tutihasi, Simpei; and Nelson, Kyler F., 3,944,332.
Nelson, Norman A., to Upjohn Company, The. 3-Oxa prostaglandin E-type compounds. 3,944,593, Cl. 260-468.00D.
Nelson, Norman A., to Upjohn Company, The. PGF, -oxaphenylene compounds. 3,944,595, Cl. 260-473.00A.
Nepon Kabushiki Kaisha (Nepon Inc.): *See—*
Miya, Masami; Nagasaki, Masao; and Harada, Shuichi, 3,943,578.
Nessel, Jiri M., to Richards, Victor. Audio apparatus. 3,944,234, Cl. 274-9.00B.
Neubauer, Josef: *See—*
Meisner, Alfred; Oellig, Oskar; Neubauer, Josef; and Kratz, Bernhard, 3,944,795.
New Japan Chemical Company, Limited: *See—*
Naramoto, Isao; Kyuma, Tatsuo; and Akazome, Giichi, 3,944,613.
Newcamp, Charles W.: *See—*
Weit, James G.; and Newcamp, Charles W., 3,944,907.
Newman, Albert P.; and Arrighi, Victor L. Electrical connectors with keying means. 3,944,316, Cl. 339-111.000.
Newstead, Charles; and Wright, Andrew Charles Walden, to Girling Limited. Vehicle wheel brake actuators. 3,943,829, Cl. 92-29.000.
Newyear, Raymond W.: *See—*
Lewis, James M.; and Newyear, Raymond W., 3,944,421.
Nicholl Brothers, Inc.: *See—*
Nicholl, Thomas H.; and Collins, John J., 3,944,761.
Nicholl, Thomas H.; and Collins, John J., to Nicholl Brothers, Inc. Rotary switch. 3,944,761, Cl. 200-11.0EA.
Nickelsen, Hubert O.; Kopanda, Joseph E.; and Piasecki, Felix J., to United States Steel Corporation. Method of sintering calcium aluminate raw mixes. 3,944,426, Cl. 106-100.000.
Niederer, Kurt W., to W. Schlafhorst & Co. Method and means for forming knit fabric incorporating a fancy warp stitch weave. 3,943,731, Cl. 66-86.00B.
Niemann, Helmut: *See—*
Stoffers, Helmut; George, Rudolf; Niemann, Helmut; and Rudszinat, Willy, 3,943,944.
Niemeyer, Ludwig: *See—*
Lindermann, Herbert; and Niemeyer, Ludwig, 3,943,634.
Niepmann, Otto, to Maschinenfabrik Fr. Niepmann & Co. Cut for a box for cigarettes and cigarillos and box made therefrom. 3,944,066, Cl. 206-268.000.
Nifco Inc.: *See—*
Hara, Kunio, 3,943,607.
Yoda, Takuo, 3,944,177.
Nihon Denshi Kabushiki Kaisha: *See—*
Matsuda, Hisashi, 3,944,827.
Sato, Masayuki, 3,944,829.
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, to Mita Industrial Company Limited. Photosensitive material in use for diazo-type multicolor reproduction. 3,944,422, Cl. 96-49.000.
Niimi, Masayasu: *See—*
Tanihara, Yozo; and Niimi, Masayasu, 3,945,033.
Nikles, Erwin; Dittrich, Volker; and Pinter, Ladislaus, to Ciba-Geigy AG. Combating insects with o dimethoxymethylphenyl-N-methylcarbamate. 3,944,674, Cl. 424-300.000.
Nikulin, Sergei Sergeevich: *See—*
Vainer, Shimon Abramovich; Temerev, Anatoly Fedorovich; Vainer, Savely Abramovich; Nikulin, Sergei Sergeevich; Kheifets, Matvei Evseevich; Usoltsev, Vadim Anatolievich; Matveev, Evgeny Fedorovich; Kazakov, Georgy Petrovich; Salkov, Vladimir Alexandrovich; and Malinin, Anatoly Isidorovich, 3,944,441.
Nilsson, Thomas, to Stiga AB. Shooting target with illuminating bulb. 3,944,227, Cl. 273-102.400.
Ning, Tak S.: *See—*
Thompson, Maxwell A.; and Ning, Tak S., 3,944,846.
Ninomiya, Syogo: *See—*
Okada, Akira; Izumi, Ryoji; Ninomiya, Syogo; Tahara, Yukio; Takehara, Yuji; Suezawa, Masaaki; and Kawasaki, Kazuhiro, 3,944,144.
Nippon Air Brake Company, Ltd., The: *See—*
Nagase, Minoru, 3,944,287.
Nippon Electric Company, Limited: *See—*
Honda, Hisashi, 3,944,962.
Matsuo, Yoshio, 3,944,929.
Murakami, Hiroshi, 3,944,991.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Nagai, Yohei; and Wachi, Masatada, 3,943,812.
Nippon Hoso Kyokai: *See—*
Chikawa, Junichi, 3,944,823.
Nippon Kogaku K.K.: *See—*
Ichimura, Takeo; and Kaneko, Teruo, 3,944,697.
Kimura, Shuji; and Ohmori, Sachio, 3,945,027.
Nippon Piston Ring Co., Ltd.: *See—*
Takao, Tsutomu, 3,944,236.
Nippon Steel Corporation: *See—*
Imai, Hiroyuki; and Kaharu, Rikuo, 3,944,193.
Nippondenso Co., Ltd.: *See—*
Akita, Shigeyuki; and Ito, Osamu, 3,944,981.
Arai, Hiroshi; Watanabe, Yohei; Ohta, Jun; Higo, Nobumasa; and Sakurai, Yasuhiko, 3,944,969.
Kinugawa, Masumi, 3,943,891.
Nishiue, Yoshihiro: *See—*
Tsunoda, Ichiro; Takeuchi, Satoshi; Hirao, Yoichiro; Suzuki, Takeo; Nishiue, Yoshihiro; Tadokoro, Katsumasa; Fukagawa, Toshimasa; Harada, Isamu; Misawa, Akira; and Watanabe, Kazuo, 3,944,330.
Nishiyama, Keizo; Yoshida, Yasushi; Yamazaki, Mutsumi; Iwata, Koshi; and Tanaka, Yoshiaki, to Kabushiki Kaisha Jidoshokki Seisakusho. Process for the manufacture of resin-coated refractory particles, preferably sand. 3,944,514, Cl. 260-38.000.
Nissan Motor Company Limited: *See—*
Hirashima, Kenzo; and Fujiwara, Yasuhiko, 3,944,764.
Koyanagi, Haruo; Takahashi, Masayoshi; Yamauchi, Nobuharu; Matsumura, Masaji; and Morimoto, Katsuhide, 3,944,987.
Nagumo, Shin-ichi; Nakajima, Yasuo; Hayashi, Yoshimasa; and Sugihara, Kunihiko, 3,943,711.
Takahashi, Kunihiro; Aya, Norimoto; Osaka, Kenji; and Furuta, Mithuru, 3,944,278.
Yamamori, Takahiro, 3,944,016.
Nissei Plastic Industrial Co., Ltd.: *See—*
Sato, Wasuke; Iriko, Fumio; Yuzawa, Yoshihiko; Takeuchi, Setsuyuki; and Ibe, Nobukuni, 3,944,643.
Nissin Electric Co., Ltd.: *See—*
Suzuki, Yasuo, 3,944,887.
Nitro Nobel AB: *See—*
Persson, Per-Anders, 3,943,820.
Nitto Electric Industrial Co., Ltd.: *See—*
Mizutani, Kazunori; Kitaura, Toshihiko; and Noo, Minoru, 3,943,623.
Noba, Motoi; and Yoshida, Hatsuyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Tokai Rika Denki Seisakusho K.K. Electric switch having a sealed casing. 3,944,774, Cl. 200-302.000.
Noguchi, Matsusaburo: *See—*
Watanabe, Akinori; and Noguchi, Matsusaburo, 3,943,848.
Noguera, John Michael. Yarn spinning apparatus. 3,943,690, Cl. 57-58.890.
Nonomaque, Clyde Joseph; Tillman, Harry Lucian; and Hortin, Kenneth L., to Whirlpool Corporation. Freezer liner construction. 3,944,111, Cl. 220-63.00R.
Noo, Minoru: *See—*
Mizutani, Kazunori; Kitaura, Toshihiko; and Noo, Minoru, 3,943,623.
Norcon Electronic Laboratories, Inc.: *See—*
Johnson, Richard A.; and Scott, Douglas E., 3,944,892.

Nordegren, Sven-Ake; and Olander, Karl Erik, to Alfa-Laval AB. Pipeline milking system. 3,943,888, Cl. 119-14.050.
Nordischer Maschinenbau Rud. Baader: *See*—
Hartmann, Franz, 3,943,603.
Nordson Corporation: *See*—
Tammy, Simon Z., 3,943,823.
Norgren, Robert S. Injection apparatus. 3,943,927, Cl. 128-218.00D.
Northstar Athletic Industries, Inc.: *See*—
Kallestad, Steven B.; and May, Robert H., 3,943,924.
Northwest Engineering Company: *See*—
Gohr, Robert A., 3,944,099.
Norwood, Haskell J., to Gainesville Machine Company, Inc. Method and apparatus for seating poultry feather plucking fingers. 3,943,599, Cl. 17-1.00R.
NRM Corporation: *See*—
Cantarutti, Armindo, 3,944,456.
Null, Robert A.: *See*—
Samhammer, Clair A.; Ellsworth, Arthur W.; Sullivan, James P.; Artmann, John A.; and Null, Robert A., 3,944,032.
Nussdorfer, Theodore J.: *See*—
Figler, Burton D.; and Nussdorfer, Theodore J., 3,944,167.
Nystrand, Ernst Daniel, to Paper Converting Machine Company. Fluff article and method and apparatus for forming same. 3,943,605, Cl. 19-145.000.
Obata, Yoshiharu: *See*—
Harao, Norio; Obata, Yoshiharu; and Yamaguchi, Tatsuo, 3,944,880.
Obayashi, Takashi: *See*—
Suto, Munehisa; Itoh, Takuji; Tagaya, Nobuaki; and Obayashi, Takashi, 3,944,503.
Oberdiear, Robert C., to Amex Systems, Inc. Adapter for shielded electrical cable connections. 3,944,317, Cl. 339-143.00R.
Oberholtzer, James E.: *See*—
Field, Edwin L.; Lamantia, Charles R.; Lunt, Richard R.; Oberholtzer, James E.; and Valentine, James R., 3,944,649.
Obregon, Alejandro. Underground automatic parking system for vehicles. 3,944,085, Cl. 214-16.10C.
Occidental Petroleum Corporation: *See*—
Stewart, Robert D.; and McKinley, John R., 3,944,653.
Oce-van der Grinten N.V.: *See*—
Vola, Mathias J. J. M.; Koeleman, Gerardus A. J.; and Peeters, Franciscus M. J., 3,943,886.
O'Connor, Lawrence V.: *See*—
Welden, Robert P.; and O'Connor, Lawrence V., 3,944,142.
Oellig, Oskar: *See*—
Meisner, Alfred; Oellig, Oskar; Neubauer, Josef; and Kratz, Bernhard, 3,944,795.
Offshore Devices, Inc.: *See*—
Milgram, Jerome H., 3,943,720.
Oganian, Mavra Vagarshanovna: *See*—
Galoian, Armen Anushavanovich; Alexanian, Ruben Arshakovich; and Oganian, Mavra Vagarshanovna, 3,944,665.
Ogata, Toshiaki: *See*—
Shimoi, Akio; Oguchi, Kikuo; and Ogata, Toshiaki, 3,944,862.
Ogawa, Yoshio, to Sony Corporation. Video projecting system. 3,944,734, Cl. 178-7.910.
Ogron, Bernard L., to Globe Glass & Trim Company. Machine for laminating glass. 3,944,461, Cl. 156-538.000.
Oguchi, Kikuo: *See*—
Shimoi, Akio; Oguchi, Kikuo; and Ogata, Toshiaki, 3,944,862.
Ohashi, Tamihiro: *See*—
Okamoto, Takehiko; Ohashi, Tamihiro; and Koga, Isao, 3,944,622.
Ohmori, Sachio: *See*—
Kimura, Shuji; and Ohmori, Sachio, 3,945,027.
Ohshima, Iwao: *See*—
Ishida, Yotsuo; Okazaki, Takeo; Matsumura, Hajime; Menju, Shinichi; and Ohshima, Iwao, 3,944,886.
Ohshima, Syunji: *See*—
Kaneko, Masayasu; Ohshima, Syunji; and Asanuma, Yasuaki, 3,944,930.
Ohta, Jun: *See*—
Arai, Hiroshi; Watanabe, Yohei; Ohta, Jun; Higo, Nobumasa; and Sakurai, Yasuhiko, 3,944,969.
Ohtani, Tadoa; Kato, Nobuyuki; Kojima, Shigeru; Sakamoto, Yoichi; Tsukahara, Masaharu; Kojima, Kiyoshi; Konno, Isago; and Kubo, Takao, to Matsushita Electric Industrial Co., Ltd. Method of making permanent magnets of Mn-Al-C alloy. 3,944,445, Cl. 148-121.000.
Okada, Akira; Izumi, Ryoji; Ninomiya, Syogo; Tahara, Yukio; Takehara, Yuji; Suezawa, Masaaki; and Kawasaki, Kazuhiro, to Dai Nippon Toryo Co., Ltd. Method and apparatus for dispersing suspensions. 3,944,144, Cl. 241-22.000.
Okada, Hisao: *See*—
Mogi, Takao; and Okada, Hisao, 3,944,982.
Okamoto, Takehiko; Ohashi, Tamihiro; and Koga, Isao, to Chisso Corporation. Method for producing ketones. 3,944,622, Cl. 260-593.00R.
Okazaki, Takeo: *See*—
Ishida, Yotsuo; Okazaki, Takeo; Matsumura, Hajime; Menju, Shinichi; and Ohshima, Iwao, 3,944,886.
Oki Electric Industry Co., Ltd.: *See*—
Watanabe, Akinori; and Tanoshima, Katsuhide, 3,943,847.
Watanabe, Akinori; and Noguchi, Matsusaburo, 3,943,848.
Oki, Ryuji, to Sony Corporation. Voltage converter. 3,944,908, Cl. 321-15.000.
Okumichi, Toshiharu: *See*—
Ishibe, Shuhei; Okumichi, Toshiharu; and Matsumoto, Keizo, 3,944,532.
Olander, Karl Erik: *See*—
Nordegren, Sven-Ake; and Olander, Karl Erik, 3,943,888.
Olette, Michel: *See*—
Gatellier, Christian; and Olette, Michel, 3,944,476.
Olin Corporation: *See*—
Bakoledis, Andrew G., 3,944,067.
Caule, Elmer J., 3,944,449.
Doerr, Richard L., 3,944,382.
Ford, James A.; and Butt, Sheldon H., 3,944,504.
Smith, Lester E.; and Kilbourn, Dean R., 3,944,249.
Olschewski, Armin: *See*—
Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, 3,944,011.
Olson, Herbert O., to 2001 Plastics, Ltd. Curling stone washer and handle assembly. 3,944,228, Cl. 273-128.0CS.
Olson, Raymond A.: *See*—
Manganaro, James L.; Cummins, Richard W.; and Olson, Raymond A., 3,944,548.
Omation Corporation: *See*—
Bingham, George H.; and Krupotich, Edward A., 3,943,807.
Ono, Hisatake: *See*—
Katsuyama, Harumi; and Ono, Hisatake, 3,944,556.
Ono, Takehiro: *See*—
Ueno, Masaaki; and Ono, Takehiro, 3,945,019.
Ono, Yoshikazu, to Kabushiki Kaisha Suwa Seikosha. Rotor for electronic wristwatch step motor. 3,943,698, Cl. 58-23.00D.
Oppenlaender, Knut: *See*—
Distler, Dieter; Wendel, Kurt; Einwiller, Andreas; and Oppenlaender, Knut, 3,944,690.
Optical Business Machines: *See*—
Holmes, Thomas G.; and Seib, Kenneth L., 3,944,977.
Optical Research and Development Corporation: *See*—
Humphrey, William E., 3,944,325.
Optical Sciences Group: *See*—
Sterne, Karl E., 3,943,648.
Orban nee Kelemen, Marika: *See*—
Solymar, Karoly; Zambo, Janos; Orban nee Kelemen, Marika; Bujdoso, Erno; Feher, Ivan; Ozvald, Zoltan; Voros, Istvan; Ferenczi, Tibor; Toth, Pal; Lazar, Ferenc; Pinter, Tihamer; Sigmond, Gyorgy; Siklosi, Peter; Wentzely, Kalman; Lengyel, Laszlo; and Matyasi, Jozsef, 3,944,648.
O'Reilly, Daniel W.; and O'Reilly, Joseph D. Power trains and power train controls. 3,944,143, Cl. 239-650.000.
O'Reilly, Joseph D.: *See*—
O'Reilly, Daniel W.; and O'Reilly, Joseph D., 3,944,143.
O'Reilly, Thomas B.: *See*—
Boyden, Robert E., 3,944,052.
O'Rell, Michael K., to TRW Inc. Bis quinoline peri acids. 3,944,553, Cl. 260-287.00P.
Orenski, Peter Joseph: *See*—
Marsden, James Glenn; and Orenski, Peter Joseph, 3,944,574.
Orlin, Peter A.: *See*—
Cutchins, Malcolm A.; Foster, Winfred A., Jr.; Orlin, Peter A.; Martin, Fred W.; and Burkhalter, John E., 3,944,137.
Orr, Clyde, Jr., to Georgia Tech Research Institute. Method and apparatus for determining the relative weight proportions of different size fractions of a sample of particulate material. 3,943,754, Cl. 73-61.400.
Osajima, Yoshihiro; Imao, Syoji; Shinomiya, Tokuo; Mihara, Sirou; and Edamatsu, Michisuke, to Mitsubishi Rayon Co., Ltd. Process for continuously producing composite porous flakes. 3,944,639, Cl. 264-13.000.
Osaka, Kenji: *See*—
Takahashi, Kunihiro; Aya, Norimoto; Osaka, Kenji; and Furuta, Mithuru, 3,944,278.
Osborn, James Richard, Jr.: *See*—
Fernstrom, George Arvid; and Osborn, James Richard, Jr., 3,944,071.
O'Sheeran, John H. Prefabricated, modular structure formed by laterally spaced cantilever arch frame assemblies. 3,943,672, Cl. 52-73.000.
Oster, Clark L., to Square D Company. Current limiting circuit breaker. 3,944,953, Cl. 335-23.000.
Otsuki, Hiroshi; Sakuma, Kenzo; and Matsuzawa, Isamu, to Takasago Perfumery Co., Ltd. Process for preparing alkali metal salts of carbazole. 3,944,565, Cl. 260-315.000.
Outboard Marine Corporation: *See*—
Lassanske, George G., 3,944,006.
Owaki, Kenichi; Urade, Toshinori; and Hirose, Tadatsugu, to Fujitsu Limited. Gas discharge device having a function of shifting discharge spots. 3,944,875, Cl. 315-169.0TV.
Owatonna Tool Company: *See*—
Steinberg, Richard W.; McClocklin, Samuel B.; and Kostelecky, Clarence L., 3,943,843.
Owen, Albert E., to Electronic Flange Lubricators, Inc. Flanged wheel lubricating apparatus. 3,944,025, Cl. 184-3.00R.
Owens-Corning Fiberglas Corporation: *See*—
Foley, Kevin M.; McCombs, Frank Paul; and Bell, Reuben H., 3,944,515.
Foley, Kevin M.; and Vigo, Francesco M., 3,944,707.
Owens-Illinois, Inc.: *See*—
Lee, Haynes A., Jr.; and Rapp, Charles F., 3,944,329.
Murley, Ellsworth M., Jr., 3,944,874.

Taylor, Lynn J., 3,944,511.
Uhlig, Albert R., 3,944,642.
Yoldas, Bulent E., 3,944,658.

Ozvald, Zoltan: *See—*
Solymar, Karoly; Zambo, Janos; Orban nee Kelemen, Marika; Bujdoso, Erno; Feher, Ivan; Ozvald, Zoltan; Voros, Istvan; Ferenczi, Tibor; Toth, Pal; Lazar, Ferenc; Pinter, Tihamer; Sigmond, Gyorgy; Siklosi, Peter; Wentzely, Kalman; Lengyel, Laszlo; and Matyasi, Jozsef, 3,944,648.

P.D.I. Inc.: *See—*
Weaver, Earl W., 3,944,266.

P.F.W. Beheer B.V.: *See—*
Cohen, Amnon Mordechai, 3,944,596.

Package Machinery Company: *See—*
Schoppee, Lawrence W.; and D'Antonio, Alfred, 3,943,809.

Palermo, Anthony, Jr.: *See—*
Heisner, Donald N.; Palermo, Anthony, Jr.; and Loyer, Phillip K., 3,944,831.

Palmer, Howard J. Oil cooling system. 3,943,909, Cl. 123-196.0AB.

Palmer, John D. Dory. 3,943,586, Cl. 9-6.00M.

Panel Technology, Inc.: *See—*
Kupsky, George A., 3,944,868.

Panella, Edward A., to United States of America, Navy. Two area rocket nozzle. 3,943,708, Cl. 60-242.000.

Panin, Igor Ivanovich: *See—*
Misulovin, Leonid Yakovlevich; Panin, Igor Ivanovich; Soloveichik, Yakov Girshevich; Kovalev, Leonid Anisimovich; and Zhoglo, Viktor Olimpievich, 3,944,956.

Papacek, Frank C. Frostproof hydrants for use in fluid handling. 3,943,963, Cl. 137-283.000.

Paper Converting Machine Company: *See—*
Nystrand, Ernst Daniel, 3,943,605.

Parc-Amber Company Limited, The: *See—*
Chambers, Roger Nicolas Crovo; and Amis, Peter William, 3,944,922.

Parent, Richard A., to Xerox Corporation. Transparency. 3,944,710, Cl. 428-412.000.

Parent, Richard A., to Xerox Corporation. Transparency. 3,944,711, Cl. 428-412.000.

Park-Ohio Industries, Inc.: *See—*
Bober, Lee M., 3,944,446.

Parker, Bernard; Gross, Otto; and Buchler, Joseph, to Buchler Instruments Div. of Searle Analytic Inc. Concentrating vortex shaker. 3,944,188, Cl. 259-54.000.

Parker-Hannifin Corporation: *See—*
Treichler, Ernest, 3,943,968.

Partensky, Pierre Jean Marc, to Societe Anonyme dite B.T.B. Benoit le Tapis Brosse. Method of and apparatus for making a plush-type cloth. 3,944,451, Cl. 156-72.000.

Pashtukas, Algis Vladislavovich: *See—*
Apsit, Voldemar Voldemarovich; Dombur, Lev Eduardovich; Lutsavs, Yan Yanovich; Pugachev, Vladislav Alexandrovich; Schukin, Mikhail Ivanovich; Dirzhis, Sauljus Antanovich; Karosas, Iozas Ionovich; Pashtukas, Algis Vladislavovich; and Khlavnovich, Leonid Borisovich, 3,944,863.

Paslay, LeRoy C., to United States of America, Navy. Pinging controlled anti-torpedo device. 3,943,870, Cl. 114-20.00R.

Pastre, Maurice, to Pepro. Methods for controlling cannibalism and tail biting in pigs. 3,944,669, Cl. 424-232.000.

Patel, Bhupendra C., to Kendall Company, The. Multi-chamber container and method. 3,943,929, Cl. 128-275.000.

Paterson Zochonis & Company, Limited: *See—*
Cleaver, David Frederick, 3,944,668.

Paton, Boris Evgenievish; Dudko, Daniil Andreevich; Gvozdetsky, Vasily Stepanovich; Asoyants, Grigory Bagradovich; Sklyarevsky, Vladik Efimovich; Skrypnik, Valentin Ivanovich; and Shmakov, Eduard Ivanovich. Power supply source for arc welding. 3,944,780, Cl. 219-131.0WR.

Patouilliart, Rene G.: *See—*
Bizien, Jean-Pierre; Patouilliart, Rene G.; and George, Michel, 3,944,168.

Paul, William A. Piercing and coining apparatus. 3,943,745, Cl. 72-335.000.

Pauletich, Joseph. Deep water sound imploder. 3,944,019, Cl. 181-120.000.

Paustian, John E.; and Gelbein, Abraham P., to Lummus Company, The. Production of amine salts of carboxylic acids. 3,944,598, Cl. 260-501.100.

Pavliichuk, Georgy Anatolievich: *See—*
Shtanko, Jury Pavlovich; Baglai, Vitaly Mikhailovich; Medovar, Boris Izrailevich; Stupak, Leonid Mikhailovich; Pavliichuk, Georgy Anatolievich; and Bogachenko, Alexei Georgievich, 3,944,714.

Peacock, Odette A.: *See—*
Gonzalez, David A.; and Peacock, Odette A., 3,944,268.

Pears, Gordon Edmund Alfred: *See—*
Mathews, Carl Fraser; Deverell, Christopher; Pears, Gordon Edmund Alfred; and Knowles, Peter George, 3,944,699.

Pech, Christian H.: *See—*
Azalbert, Jean-Paul; Giraud, Adrien; Tassin, Claude J.; and Pech, Christian H., 3,943,721.

Pedersen, Peder Fahrsen. Gangway element. 3,943,589, Cl. 14-72.00R.

Peel, Richard V.: *See—*
Moe, James E.; Peel, Richard V.; and Smith, Richard E., 3,944,173.

Peeters, Franciscus M. J.: *See—*
Vola, Mathias J. J. M.; Koeleman, Gerardus A. J.; and Peeters, Franciscus M. J., 3,943,886.

Peichl, Robert: *See—*
Dorr, Karl-Heinz; Grimm, Hugo; Sander, Ulrich; Peichl, Robert; and Tacke, Michael, 3,944,401.

Pelleray, Roger: *See—*
Nee, Paul, 3,943,615.

Pellicano, Emilio, to Honeywell Information Systems Italia. Device for guiding the magnetic tape in magnetic tape handling apparatus. 3,944,122, Cl. 226-198.000.

Penning, Cornelis, to U.S. Philips Corporation. Microphone provided with a cylindrically shaped microphone cartridge. 3,944,759, Cl. 179-184.000.

Pennock, Michael Derek, to Subsea Equipment Associates, Ltd. Apparatus for guiding a load between a surface apparatus and a submerged base platform. 3,943,725, Cl. 61-46.500.

Pennsylvania Engineering Corporation: *See—*
Fisher, Howard M.; Albers, Bernd G.; and Mrozek, John W., 3,944,083.

Pennsylvania Research Associates, Inc.: *See—*
McInerny, George P., 3,944,210.

Pennwalt Corporation: *See—*
Inman, Charles Edward, 3,944,688.

Pepper, Kenneth V., to Genova, Inc. Switch assembly. 3,944,770, Cl. 200-84.00R.

Pepro: *See—*
Pastre, Maurice, 3,944,669.

Percifield, Edward K., to Carlisle Corporation. Air cooled belt clutch. 3,943,785, Cl. 74-242.120.

Perkin-Elmer Corporation, The: *See—*
Delany, Edward B., 3,943,766.

Perkins Research and Manufacturing Co.: *See—*
Simmonds, James F., 3,944,914.

Perkins, Robert B. Display system. 3,944,998, Cl. 340-324.0AD.

Perkins, Thomas K., to Atlantic Richfield Company. Method of assembly of a dual-walled pipe. 3,943,618, Cl. 29-407.000.

Perrella, Donald J.; and Dolfini, Joseph E., to E. R. Squibb & Sons, Inc. Bis-cephalosporins. 3,944,544, Cl. 260-243.00C.

Perry, Frederick G.: *See—*
Audette, Richard T.; and Perry, Frederick G., 3,944,960.

Person, Abraham; and Bolding, Vance E., to Global Marine Inc. Heave compensation apparatus for a marine mining vessel. 3,943,868, Cl. 114-.50D.

Personal Communications, Inc.: *See—*
Yevick, George J., 3,944,350.

Persson, Eric Sigfrid, to Expo Nord AB. Frame for supporting articles. 3,944,308, Cl. 312-111.000.

Persson, Per-Anders, to Nitro Nobel AB. Method for charging drill holes with explosive. 3,943,820, Cl. 86-20.00C.

Pertec Corporation: *See—*
Desai, Ashok K., 3,944,940.

Pesaro, Mario: *See—*
Dubs, Paul; Kuntzel, Heiner; Pesaro, Mario; and Schmidt, Harald, 3,944,561.

Peskin, Samuel: *See—*
LoPresti, Roy F., 3,944,219.

Peters, Clifford M.: *See—*
Connelly, Lawrence K.; and Peters, Clifford M., 3,943,974.

Peters, Philip H., Jr.: *See—*
Wilbur, Donald A.; and Peters, Philip H., Jr., 3,944,872.

Peterson, David Cartwright: *See—*
Beck, Frank Valentine; Peterson, David Cartwright; Prell, Edward Myron; and Quin, Terrence Thomas, 3,944,800.

Petke, Frederick D., to Eastman Kodak Company. Adhesive composition. 3,944,516, Cl. 260-40.00R.

Petrini, Richard R.; and Van Lue, Dorin F. Borderless printing easel. 3,944,364, Cl. 355-74.000.

Petrocarbon Developments Limited: *See—*
Bird, Graham, 3,944,400.

Petroczky, Frank G. Pipe repair fittings. 3,944,260, Cl. 285-15.000.

Petskus, Ronald A.: *See—*
Bigatel, Alfred I.; Jarrett, Quentin T.; Petskus, Ronald A.; Rowan, David C.; and Scheetz, Joseph M., 3,944,419.

Petterec, Robert E.; and Hutner, Mark A., to Xerox Corporation. Dual ribbon fuser. 3,944,784, Cl. 219-216.000.

Pettersson, Georg Gustaf Lennart, to Telefonaktiebolaget L M Ericsson. Arrangement for generating pulse sequences. 3,944,858, Cl. 307-269.000.

Pettler, Peter R.: *See—*
Criglar, John J.; and Pettler, Peter R., 3,944,743.

Pfiffner, Albert: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,944,531.

Pfizer Inc.: *See—*
Evanega, George R.; Kuhla, Donald E.; and Sarges, Reinhard, 3,944,524.
Froberg, Robert W., 3,944,686.

Phelan, Charles S.: *See—*
Kessell, Archie; Kottsieper, Edward J.; Phelan, Charles S.; and Ranalli, Ralph, 3,944,133.

Phillips, John Norbert, to Commonwealth Scientific & Industrial Research Organization. Pyridinium salts. 3,944,557, Cl. 260-294.900.

Phillips Petroleum Company: *See—*
Baldwin, Bernard A., 3,944,491.
Cardwell, Charles G.; and Speck, Morris E., 3,944,070.

Hunt, Harold R., 3,944,392.
McClintock, William A.; and Proctor, Oliver P., 3,944,394.
Richards, Frank P., 3,944,126.
Smith, Ernest L., 3,944,130.

Photo Systems, Inc.: *See—*
Mitchell, Robert W., 3,944,363.

Phylpat, Inc.: *See—*
Jennerjahn, Brian M., 3,944,150.

Piasecki, Felix J.: *See—*
Nickelsen, Hubert O.; Kopanda, Joseph E.; and Piasecki, Felix J., 3,944,426.

Picker Corporation: *See—*
Heisner, Donald N.; Palermo, Anthony, Jr.; and Loyer, Phillip K., 3,944,831.

Pierrat, Jean Joseph Henri, to Societe Avions Marcel Dassault -Breguet Aviation. Detection of angular position. 3,944,821, Cl. 250-237.00G.

Pike, Charles T.; and Levy, Richard H., to Jersey Nuclear-Avco Isotopes, Inc. Laser amplifier system. 3,944,947, Cl. 331-94.50D.

Pillsbury, Paul W.: *See—*
DeCorso, Serafino M.; and Pillsbury, Paul W., 3,943,705.

Pilot Man-Nen-Kitsu Kabushiki Kaisha: *See—*
Inada, Kunio; and Yamaguchi, Morio, 3,943,851.

Pines, Seemon H.: *See—*
Tull, Roger J.; Czaja, Robert F.; Shuman, Richard F.; and Pines, Seemon H., 3,944,600.

Pinter, Ladislaus: *See—*
Nikles, Erwin; Dittrich, Volker; and Pinter, Ladislaus, 3,944,674.

Pinter, Tihamer: *See—*
Solymar, Karoly; Zambo, Janos; Orban nee Kelemen, Marika; Bujdoso, Erno; Feher, Ivan; Ozvald, Zoltan; Voros, Istvan; Ferenczi, Tibor; Toth, Pal; Lazar, Ferenc; Pinter, Tihamer; Sigmond, Gyorgy; Siklosi, Peter; Wentzely, Kalman; Lengyel, Laszlo; and Matyasi, Jozsef, 3,944,648.

Piper, Paul Alfred. Clamp. 3,944,179, Cl. 248-226.00R.

Pipkin, Edward L.; and Tolbert, William H., to United States of America, Navy. River mine countermeasure device. 3,943,874, Cl. 114-221.00A.

Piret, Pierre; Fraikin, Hubert; and Hubert, Armand, to C.G.R. -MeV. Auxiliary collimating device for obtaining irradiation fields of any shape for high energy radiotherapy apparatus. 3,944,836, Cl. 250-505.000.

Piretti, Giancarlo. Modular members for composing pieces of furniture, as padded chairs, easy-chairs, divans and divans convertible in beds. 3,944,281, Cl. 297-440.000.

Pitman-Moore, Inc.: *See—*
Bittle, James Long; and Rubic, Wayne J., 3,944,469.

Pitney-Bowes, Inc.: *See—*
Beck, Christian A., 3,944,215.

Place, Georges: *See—*
Duret, Georges; Place, Georges; and Rousseau, Jean, 3,944,468.

Plant, Anthony Brian, to Joseph Lucas (Industries) Limited. Apparatus for generating a d.c. signal proportional to an input frequency. 3,944,935, Cl. 328-140.000.

Plantronics, Inc.: *See—*
Criglar, John J.; and Pettler, Peter R., 3,944,743.

Plastonium, Inc.: *See—*
Gunnerman, Rudy W., 3,944,685.

Platt International Limited: *See—*
Mizon, Eric; and Moores, Hugh, 3,943,691.
Wright, Thomas Henry; and Lane, Robert, 3,943,596.

Plessey Handel und Investments AG.: *See—*
Kent, Alan Hugh; and Fell, Peter Howard, 3,944,328.

Pletcher, Robert E., to Asplundh Tree Expert Co. Brush chipper. 3,944,147, Cl. 241-60.000.

Plumat, Emile; and Mairesse, Jean-Pierre, to Glaverbel-Mecaniver. Method and apparatus for pre-heating vitrifiable batch. 3,944,713, Cl. 13-6.000.

Poclain: *See—*
Becquet, Jean E., 3,943,827.

Podvin, Richard T.; and Look, Thomas F., to Minnesota Mining and Manufacturing Company. Strip material applying device. 3,944,457, Cl. 156-405.000.

Poignantw, Jean-Claude: *See—*
Regnier, Gilbert; Canevari, Roger; Laubie, Michel; and Poignantw, Jean-Claude, 3,944,551.

Poix, Claude Louis, to Timex Corporation. Regulator and balance bridge arrangement for a horological device. 3,943,701, Cl. 58-109.000.

Polaroid Corporation: *See—*
Benton, Stephen A., 3,944,322.
Bloom, Stanley M.; Idelson, Elbert M.; Simon, Myron S.; and Waller, David P., 3,944,569.
Dennis, John J., Jr.; and McCole, Thomas P., 3,944,701.
Levy, Boris, 3,944,709.
Mills, Loring K., 3,943,786.
Stempeck, John W., 3,945,025.

Politechnika Lodzka: *See—*
Kwasniak, Jak, 3,944,407.

Pollak-Banda, Erich: *See—*
Kummel, Louis; Morhart, Rudolf; and Pollak-Banda, Erich, 3,943,788.

Pollanz, Herwig, to Gesellschaft fur Kernforschung m.b.H. Precision temperature control. 3,943,774, Cl. 73-432.00R.

Polyanin, Valery Andreevich; Berkovich, Anatoly Jurievich; Zabegalov, Georgy Vasilievich; and Soin, Jury Konstantinovich. Loader. 3,944,089, Cl. 214-131.00A.

Pomerantzeff, Oleg, to Retina Foundation. Wide-angle ophthalmoscope and fundus camera. 3,944,341, Cl. 351-7.000.

Poncha, Rustom P.: *See—*
Gancy, Alan B.; and Poncha, Rustom P., 3,944,500.

Ponticelli, Fabio: *See—*
Adembri, Giorgio; Tedeschi, Piero; Ponticelli, Fabio; and Marini, Maresco, 3,944,563.

Ponticello, Ignazio: *See—*
Cohen, Hyman L.; Koeng, Frederick; and Ponticello, Ignazio, 3,944,424.

Populin, Louis: *See—*
Populin, Peter; Populin, Louis; and Scalia, Guiseppe, 3,943,862.

Populin, Peter; Populin, Louis; and Scalia, Guiseppe. Sugar cane planting apparatus. 3,943,862, Cl. 111-3.000.

Porat, David. Method for joining resistive and conductive materials. 3,944,777, Cl. 219-118.000.

Porta Systems Corporation: *See—*
Carney, William V.; and DeLuca, Paul V., 3,944,758.
Stearn, Theodore; and De Luca, Paul V., 3,944,752.

Porter, Allan William Henry, to Saurer A.G. Automatic temple for weaving looms. 3,943,979, Cl. 139-296.000.

Porter, George: *See—*
Boyd, Dennis; and Porter, George, 3,943,941.

Portmann, Hubert; Saurer, Eric; and Hersberger, Pierre, to Ebauches S.A. Control device for setting a timepiece. 3,943,696, Cl. 58-23.00R.

Post Office, The: *See—*
Midwinter, John Edwin, 3,944,811.

Postma, Willem Johannes, to U.S. Philips Corporation. Adjusting pin for a ferro-magnetic core. 3,944,958, Cl. 336-136.000.

Postrihac, Rudolf. Method for producing biological fertilizers from sewage. 3,944,408, Cl. 71-13.000.

Powell, B. J.: *See—*
Savage, Donald D., 3,944,097.

Power Pack Conveyor Company: *See—*
Ensinger, James L., 3,944,054.

Poynton, David John, to Courtaulds Limited. Flame-retardant filaments. 3,944,384, Cl. 8-115.500.

PPG Industries, Inc.: *See—*
Franz, Helmut, 3,944,440.
Luckock, Glenn W.; and Warnick, William V., 3,944,689.

Prasad, Balram; and Leiby, Clare C., Jr. Coherent generation of microwaves by stimulated Raman emissions. 3,944,946, Cl. 331-94.000.

Pratolongo, Modesto, to Santa Martha Bay Shipping and Trading Co., Ltd. Process for the fast cooking of metered quantities of foodstuff. 3,944,678, Cl. 426-508.000.

Preisig, Roland, to J. Bobst & Fils SA. Method and device for packaging box flats. 3,943,681, Cl. 53-35.000.

Prell, Edward Myron: *See—*
Beck, Frank Valentine; Peterson, David Cartwright; Prell, Edward Myron; and Quin, Terrence Thomas, 3,944,800.

Preusser, Gerhard: *See—*
Schwall, Fritz; Preusser, Gerhard; and Schulze, Martin, 3,944,483.

Preventive Systems, Inc.: *See—*
Harris, Nick S.; and Feinstein, Robert, 3,944,391.

Price, Harold A.: *See—*
Frisz, James O.; and Price, Harold A., 3,944,086.

Price, Harry D. Basting or cooking device. 3,943,838, Cl. 99-345.000.

Primrose, Ulyuss Lee. Modification for internal combustion engine providing improved fuel economy. 3,943,900, Cl. 123-124.00R.

Prince, Howard T.: *See—*
Harrington, Cecil F.; Johnson, James M.; and Prince, Howard T., 3,943,604.

Princeton Organics, Inc.: *See—*
Magder, Jules, 3,944,425.

Prins, Albertus: *See—*
van Pelt, Johannes George; Prins, Albertus; van Roon, Johannes Hendrik; and Smits, Petrus, 3,944,680.

Procter & Gamble Company, The: *See—*
Diehl, Francis Louvaine; Zeffren, Eugene; and Milbrada, Edward John, 3,944,470.
Harrington, Cecil F.; Johnson, James M.; and Prince, Howard T., 3,943,604.
McQueary, Agnes R., 3,944,694.

Proctor & Associates Company: *See—*
Proctor, Darryl F.; Skelly, Peter T.; and Champan, Louis W., 3,944,753.

Proctor, Darryl F.; Skelly, Peter T.; and Champan, Louis W., to Proctor & Associates Company. Apparatus for distinguishing voice and other noise signals from legitimate multi-frequency tone signals present on telephone or similar communication lines. 3,944,753, Cl. 179-84.0VF.

Proctor, Oliver P.: *See—*
McClintock, William A.; and Proctor, Oliver P., 3,944,394.

Projects Unlimited, Inc.: *See—*
Myers, John L., 3,945,004.

Pryor, Harold A.: *See—*
Pryor, Roy R.; and Pryor, Harold A., 3,943,808.
Pryor, Roy R.; and Pryor, Harold A., 3,943,818.

Pryor, Michael J.; Ford, James A.; and Dean, Sheldon W., to Swiss Aluminium Limited. Method of preparing high fatigue strength aluminum alloy. 3,944,439, Cl. 148-2.000.

Pryor, Richard Lee, to RCA Corporation. Zero crossover detector. 3,944,936, Cl. 328-150.000.

Pryor, Roy R.; and Pryor, Harold A. Modular sawmill with mechanized handling of sawlogs and pieces cut therefrom. 3,943,808, Cl. 83-88.000.

Pryor, Roy R.; and Pryor, Harold A. Railroad tie. 3,943,818, Cl. 85-42.000.

Przybylek, George J., to Burroughs Corporation. Display panel with expansible, metallic capsule containing mercury and method of making said capsule. 3,944,869, Cl. 313-519.000.

Pugachev, Vladislav Alexandrovich: *See—*
Apsit, Voldemar Voldemarovich; Dombur, Lev Eduardovich; Lutsavs, Yan Yanovich; Pugachev, Vladislav Alexandrovich; Schukin, Mikhail Ivanovich; Dirzhis, Sauljus Antanovich; Karosas, Iozas Ionovich; Pashtukas, Algis Vladislavovich; and Khlavnovich, Leonid Borisovich, 3,944,863.

Pugin, Andre: *See—*
Model, Ernst; von der Crone, Jost; and Pugin, Andre, 3,944,547.

Pullman Incorporated: *See—*
Ferris, Ray L.; and Marulic, Walter J., 3,944,375.

Purdy, David L.: *See—*
Hursen, Thomas F.; Kolenik, Steven A.; and Purdy, David L., 3,944,438.

Purtschert, Werner, to Sulzer Brothers Limited. Gas-lubricated self-pressurizing radial bearing. 3,944,304, Cl. 308-9.000.

Puydebois, Leon M.: *See—*
Ramont, Jacques P. A.; Jean, Andre C.; Puydebois, Leon M.; Rousse, Claude R.; and Massay, Michel, 3,943,856.

Quarmby, Robert C.: *See—*
Garner, Derek H.; and Quarmby, Robert C., 3,943,885.

Quin, Terrence Thomas: *See—*
Beck, Frank Valentine; Peterson, David Cartwright; Prell, Edward Myron; and Quin, Terrence Thomas, 3,944,800.

Quinn, Clayton B.; and Williams, Frank J., to General Electric Company. Novel polyetherimides prepared from tolane dianhydride or dichloroethylene diphenylene dianhydride. 3,944,517, Cl. 260-47.0CP.

Quinn, Clayton B., to General Electric Company. Bis-phenoxyphthalic acid anhydrides. 3,944,583, Cl. 260-343.400.

Rabuffetti, Sergio, to U.S. Philips Corporation. Dishwashing machine closure safety switch device. 3,944,767, Cl. 200-61.620.

Racca, Wilvin W., to Franklin Press, Inc., a part interest. Cooking apparatus. 3,943,839, Cl. 99-407.000.

Radford, Matthew Frederick, to Marconi Company Limited, The. Radar systems. 3,945,007, Cl. 343-6.00R.

Radiometer A/S: *See—*
Johansen, Ebbe, 3,943,917.

Raeske, Frank J.: *See—*
Green, Sam J.; and Raeske, Frank J., 3,943,896.

Raggett, Stephen Richard: *See—*
Sword, Geoffrey; Lawrence, John Leslie; Raggett, Stephen Richard; and Blakemore, Bernard, 3,944,739.

Raleigh Industries Limited: *See—*
Hillyer, Anthony William, 3,943,796.

Ramirez, Ciro, to Ramirez, Ciro; Readman, Edward J.; St. Jean, Norman; and Chavarria, S. T. High/low tire pressure signal device. 3,944,971, Cl. 340-58.000.

Ramont, Jacques P. A.; Jean, Andre C.; Puydebois, Leon M.; Rousse, Claude R.; and Massay, Michel, to Etat Francais. Hot gas generators, powder charges therefor, and process of production thereof. 3,943,856, Cl. 102-103.000.

Ranalli, Ralph: *See—*
Kessell, Archie; Kottsieper, Edward J.; Phelan, Charles S.; and Ranalli, Ralph, 3,944,133.

Randall, John M.; Hautala, Earl; Waiss, Anthony C., Jr.; and Kuhnle, Judith A., to United States of America, Agriculture. Removing heavy metal ions from water. 3,944,415, Cl. 75-101.0BE.

Rank Xerox, Ltd.: *See—*
Miyatsuka, Hajime; Honjo, Satoru; Sawada, Kenichi; and Saida, Takashi, 3,944,682.

Rannou, Jean: *See—*
Bizouard, Alain; and Rannou, Jean, 3,945,016.

Rapp, Charles F.: *See—*
Lee, Haynes A., Jr.; and Rapp, Charles F., 3,944,329.

Rasche, Manfred: *See—*
Brinkmann, Jurgen; Rasche, Manfred; and Heissmann, Willi, 3,944,432.

Raschle, Josef, to Heberlein Maschinenfabrik AG. Apparatus for false-twist texturing of textile yarns. 3,943,693, Cl. 57-77.450.

Raske, Theodore F.: *See—*
Learmont, Tom; Nelmark, Jack D.; Martin, Gary E.; and Raske, Theodore F., 3,944,300.

Rasmussen, Donald C.; and Funkhouser, Richard L., to NCR Corporation. Letter feeder. 3,944,211, Cl. 271-8.00R.

Rasor Associates, Inc.: *See—*
Rasor, Ned S.; and Spickler, Joseph William, 3,943,936.

Rasor, Ned S.; and Spickler, Joseph William, to Rasor Associates, Inc. Self powered pacers and stimulators. 3,943,936, Cl. 128-419.00P.

Ratner, Isaak Semenovich. Temperature control device before the turbine of a gas-turbine power unit. 3,943,704, Cl. 60-39.28T.

Rau, Rama N., to Schlumberger Technology Corporation. Method and apparatus utilizing microwave electromagnetic energy for investigating earth formations. 3,944,910, Cl. 324-6.000.

Rauhut, Herbert: *See—*
Frommeld, Hans-Dieter; and Rauhut, Herbert, 3,944,423.

Rausing, Anders Ruben, to Tetra Pak Developpement SA. Method for making, filling and sealing containers through a recloseable filling opening. 3,943,682, Cl. 53-37.000.

Ray-Chaudhuri, Dilip K.: *See—*
Schoenberg, Jules E.; and Ray-Chaudhuri, Dilip K., 3,944,428.

Ray, George F., to Liskey Aluminum Inc. Elevated floor assembly with releasable tie means connecting the panel sides. 3,943,674, Cl. 52-126.000.

Rayburn, Charles C., to Illinois Tool Works Inc. Machine for loading electric components into a carrier strip. 3,943,685, Cl. 53-73.000.

Raychem Corporation: *See—*
Reeder, Larry R., 3,944,721.

Raymond Boyd Associates: *See—*
Hendrickson, Paul E., 3,943,619.

Raymond Lee Organization, Inc., The: *See—*
Boslough, James, 3,944,079.
Bromwell, John J., 3,944,223.
Calia, Hank A., 3,943,890.
Colk, Carl F. G., 3,943,921.
Gonzalez, David A.; and Peacock, Odette A., 3,944,268.
Goursau, Daniel R., 3,943,816.
Richard, Laurie, 3,944,040.
Sparling, Robert H., 3,944,885.

Raynes, Edward Peter: *See—*
Hilsum, Cyril; Johnson, Frederick Alistair; and Raynes, Edward Peter, 3,944,817.

RCA Corporation: *See—*
Feher, Kamilo, 3,944,926.
Gale, Michael Thomas; and Kane, James, 3,944,420.
Henley, Michael Lee; and Smith, Lawrence Edward, 3,944,883.
Hoover, Merle Vincent, 3,944,859.
Kane, James; and Schweizer, Hanspeter, 3,944,684.
Pryor, Richard Lee, 3,944,936.

Readman, Edward J.: *See—*
Ramirez, Ciro, 3,944,971.

Reardon, Robert C., Jr.: *See—*
Gutierrez, Eddie N.; and Reardon, Robert C., Jr., 3,944,568.

Reckler, Lawrence L. Fishing line rudder. 3,943,653, Cl. 43-43.130.

Recognition Systems, Inc.: *See—*
Jensen, Niels P.; Kasdan, Harvey L.; and Thomasson, James T., 3,944,978.

Redman, Charles M.; and Moore, Ronald W., to United States of America, Army. Cascaded data modulation system. 3,944,948, Cl. 332-7.510.

Reed, Charles C.; Sharp, Russell G.; and Cooley, Denton A., to Texas Medical Products, Inc. Bifurcated tubing connector. 3,944,261, Cl. 285-21.000.

Reed, Frederick Frank, to GTE Sylvania Incorporated. Broadband amplifier. 3,944,943, Cl. 330-109.000.

Reeder, Larry R., to Raychem Corporation. Multiconductor wire splice device. 3,944,721, Cl. 174-88.00R.

Reehil, Edward G.; Summers, James E.; and Modi, Bhogilal M., to Xerox Corporation. Copying system control. 3,944,794, Cl. 235-92.0SB.

Rees, Frank L.: *See—*
Caporin, Edward A.; Abruzzo, Joseph; and Rees, Frank L., 3,944,965.

Reeves, Robert L. Means for preventing dry burn in a paper-plastic dunnage bag. 3,944,084, Cl. 214-10.50D.

Regester, James Williams: *See—*
Lupton, John Madison; and Regester, James Williams, 3,944,536.

Regie Nationale des Usines Renault: *See—*
Dachicourt, Augustin, 3,944,197.
de Rosa, Daniel; and Lacambre, Jacques, 3,944,276.

Regnier, Gilbert; Canevari, Roger; Laubie, Michel; and Poignantw, Jean-Claude, to Science-Union et Cie. N-Coumaranyl and chromanyl -methyl-or sulfur analogs thereof-N'- thiazolyl piperazines. 3,944,551, Cl. 260-268.0BC.

Reindl, Adolf, to United States of America, Army. Digital transmission system. 3,944,927, Cl. 325-38.00A.

Reinecke, Herbert: *See—*
Barth, Hans-Jochen; Reinecke, Herbert; Hollenbach, Georg; and Kurz, Eduard, 3,944,508.

Reinertsen, Bjarne: *See—*
Johansson, Ingemar; and Reinertsen, Bjarne, 3,943,650.

Reinker, Ralph W., to United States of America, Navy. Fail-safe limit switch stopping system for air motor. 3,943,714, Cl. 60-403.000.

Rembaum, Alan; Yen, Shiao-Ping S.; and Klein, Elias, to California Institute of Technology. Ion-exchange hollow fibers. 3,944,485, Cl. 210-24.000.

Rembold, Helmut: *See—*
Goebels, Hermann J.; Riesenberg, Klaus-Otto; and Rembold, Helmut, 3,944,290.

Rens, Walter Johannes: *See—*
Van Cappellen, Jan Baptist; and Rens, Walter Johannes, 3,944,644.

Republic Steel Corporation: *See—*
Whalen, Mark E.; Trepanier, Norman W.; Kraus, Robert A.; and Malleck, Joseph W., 3,943,617.

Research Corporation: *See—*
Swallow, Ronald J., 3,944,997.

Research Laboratories of Australia: *See—*
Matkan, Josef, 3,944,355.

Research Products/Incinolet Corporation: *See—*
Blankenship, Ernest Bayne, 3,943,579.

Retina Foundation: *See—*
Pomerantzeff, Oleg, 3,944,341.
Retobina Handelsanstalt: *See—*
Faulhaber, Fritz, 3,944,857.
Rexnord Inc.: *See—*
Dieringer, Andrew M.; and Katcha, Frank F., 3,943,858.
Reyes, Gil, to Lawrence Peska Associates, Inc., a part interest. Combination sink enclosure and shelf assembly. 3,943,581, Cl. 4-187.00R.
Reymond, Welles K. Voltage, current, or power controller utilizing a switched reactance A.C. shunt regulator. 3,944,909, Cl. 323-45.000.
Reynolds, Lawrence H.: *See—*
Smith, Verity C.; and Reynolds, Lawrence H., 3,943,616.
Reyrolle Parsons Limited: *See—*
Jewitt, Cyril, 3,944,865.
Rheaume, Walter A., to Hitco. Multi-ply woven article having double ribs. 3,943,980, Cl. 139-384.00R.
Rheinmetall GmbH: *See—*
Seifried, Paul, 3,943,821.
Rhoades, James J.: *See—*
Marsh, Walter G.; and Rhoades, James J., 3,943,744.
Rhodes, Arthur J. Spindle lubricating device. 3,944,026, Cl. 184-7.00A.
Rhodes, Sammy J.: *See—*
Bianchetta, Donald L.; Lohbauer, Kenneth R.; and Rhodes, Sammy J., 3,943,825.
Rhone-Poulenc S. A.: *See—*
Chabardes, Pierre; Grard, Charles; and Schneider, Charles, 3,944,623.
Rhone-Poulenc Textile: *See—*
Dumas, Victor, 3,944,708.
Richard, Laurie, to Raymond Lee Organization Inc., a part interest. Apparatus for facilitating pick up of dry cleaning. 3,944,040, Cl. 194-65.000.
Richards, Frank P., to Phillips Petroleum Company. Container. 3,944,126, Cl. 229-4.500.
Richards, Victor: *See—*
Nessel, Jiri M., 3,944,234.
Riedel, Dieter, to Drabert Sohne. Continuous decatizing machine. 3,943,735, Cl. 68-5.00R.
Riedmayr, Georg, to Carl Hurth, Maschinen- und Zahnradfabrik. Electronic sequence control system. 3,944,980, Cl. 340-147.00P.
Rieger, Hansjorg W. Anti-skid and protective chain. 3,943,990, Cl. 152-243.000.
Rieger, Manfred; and Kioustelidis, Johannes, to Joh. A. Benckiser GmbH. Process of producing alkali metal or ammonium citrates. 3,944,606, Cl. 260-535.00P.
Riesenberg, Klaus-Otto: *See—*
Goebels, Hermann J.; Riesenberg, Klaus-Otto; and Rembold, Helmut, 3,944,290.
Rigassi, Norbert: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,944,531.
Riley, Phillip J. Can packaging. 3,944,074, Cl. 206-427.000.
Rillie, Robert J.: *See—*
Dierks, Robert P.; and Rillie, Robert J., 3,944,698.
Riou, Yves: *See—*
Morgand, Pierre; and Riou, Yves, 3,944,751.
Ripley, George, III. Infinitely variable transmission for pedal-driven vehicles. 3,944,253, Cl. 280-238.000.
Robert Bosch GmbH: *See—*
Goebels, Hermann J.; Riesenberg, Klaus-Otto; and Rembold, Helmut, 3,944,290.
Kiencke, Uwe, 3,943,898.
Maisch, Wolfgang; and Domann, Helmut, 3,944,014.
Robertshaw Controls Company: *See—*
Hild, Henry F.; and Stearley, John W., 3,944,315.
Kalinovski, Fred, 3,944,135.
Wagner, Joseph P., 3,944,769.
Robertson, Donald A., to Xerox Corporation. Sliding platen cover apparatus. 3,944,366, Cl. 355-76.000.
Robertson, Thomas Alexander; and King, John Alfred. Blasting mats. 3,943,853, Cl. 102-22.000.
Robinson, Edward L., Jr.: *See—*
Mecklin, Charles D.; and Robinson, Edward L., Jr., 3,943,845.
Robinson, Lawrence V. Metal cutting tool guide. 3,944,194, Cl. 266-23.00E.
Robson, James A. W. Condensate removal device. 3,943,638, Cl. 34-124.000.
Rockwell International Corporation: *See—*
Anthony, Philip L., 3,944,181.
Conway, William N., 3,943,977.
Cooper, George P., 3,945,012.
Jovick, Raymond John, 3,944,864.
Wily, John L., 3,943,733.
Rocol Limited: *See—*
Bradley, Geoffrey; Hargreaves, Keith; and Wainwright, Paul, 3,944,521.
Rodek, Victor, to Xerox Corporation. Phase synchronization system with start-up sequencing and automatic shut-down. 3,944,896, Cl. 318-85.000.
Rodewald, Paul G.: *See—*
Whitehurst, Darrell D.; Butter, Stephen A.; and Rodewald, Paul G., 3,944,501.
Roemer, Erich. Lubricating pocket. 3,944,301, Cl. 308-5.00R.
Roesch, Egon: *See—*
Winter, Werner; Thiel, Max; Stach, Kurt; Roesch, Egon; and Sponer, Gisbert, 3,944,566.
Rogers, Gerald L., to Chemetron Corporation. Supporting apparatus for intravenous containers or the like. 3,944,180, Cl. 248-323.000.
Rohe Scientific Corporation: *See—*
Kessell, Archie; Kottsieper, Edward J.; Phelan, Charles S.; and Ranalli, Ralph, 3,944,133.
Rohm and Haas Company: *See—*
Clemens, David H.; and Lange, Raymond J., 3,944,507.
Greenwald, Harold L.; and Kine, Benjamin B., 3,944,513.
Rohr Industries, Inc.: *See—*
Molzon, William R., 3,944,283.
Tantlinger, Keith W., 3,944,201.
Rohr, Otto, to Ciba-Geigy Corporation. Halogenoethyl esters of aromatic carboxylic acids as fruit abscission agents. 3,944,411, Cl. 71-107.000.
Rohsler, Ivor Carl, to Joseph Lucas (Industries) Limited. Control circuits for electrically driven vehicles. 3,944,900, Cl. 318-317.000.
Roll-Rite Corporation: *See—*
Christensen, Carl O., 3,944,258.
Romer, Wilhelm: *See—*
Wetzels, Walter; Greven, Johann; Romer, Wilhelm; and Hoppe, Heinz, 3,943,743.
Ronald Trist Controls Limited: *See—*
Innes, Robert, 3,944,844.
Roper Corporation: *See—*
Dankel, Douglas D., 3,943,729.
Fielder, William Van Buren, Jr., 3,943,598.
Rose, Fred K.: *See—*
Metcalfe, Arthur G.; and Rose, Fred K., 3,944,782.
Rosen Enterprises, Inc.: *See—*
Rosen, William E., 3,943,945.
Rosen, William E., to Rosen Enterprises, Inc. Process for preparation of reconstituted tobacco sheet. 3,943,945, Cl. 131-140.00C.
Rosenbaum, Saul: *See—*
Weitzman, Milton J.; and Rosenbaum, Saul, 3,944,314.
Rosenberger, Paul C.: *See—*
Lloyd, Michael K.; and Rosenberger, Paul C., 3,944,295.
Ross, John William, to Union Carbide Canada Limited. Ground freezing method. 3,943,722, Cl. 61-36.00A.
Ross Operating Valve Company: *See—*
Bitonti, Paul A.; and Lytle, John P., 3,943,972.
Rossi, Alberto, to Ciba-Geigy Corporation. α-Cycloalkenylphenyl-fatty acid nitriles. 3,944,589, Cl. 260-465.00K.
Rossi, Thomas J. Reclosable air-tight containers with evacuation means. 3,943,987, Cl. 150-.500.
Rothbart, Herbert L.: *See—*
Luddy, Francis E.; Hampson, James W.; Herb, Samuel F.; and Rothbart, Herbert L., 3,944,585.
Rousse, Claude R.: *See—*
Ramont, Jacques P. A.; Jean, Andre C.; Puydebois, Leon M.; Rousse, Claude R.; and Massay, Michel, 3,943,856.
Rousseau, Jean: *See—*
Duret, Georges; Place, Georges; and Rousseau, Jean, 3,944,468.
Roussel Uclaf: *See—*
Farthouat, Anne; and Meier, Jean, 3,944,555.
Rowan, David C.: *See—*
Bigatel, Alfred I.; Jarrett, Quentin T.; Petskus, Ronald A.; Rowan, David C.; and Scheetz, Joseph M., 3,944,419.
Rowland-Hill, Edward W., to Sperry Rand Corporation. Combine with adjustable feed plate. 3,943,939, Cl. 130-27.00T.
Rubega, Robert A., to United States of America, Navy. Versatile at-sea test array and analysis system. 3,944,966, Cl. 340-5.00C.
Ruben, Paul Lewis, to Eastman Kodak Company. Three element objective lens with ellipsoidal, hyperbolic, and parabolic surfaces. 3,944,337, Cl. 350-189.000.
Rubey, Ulyss Ray, to United Wiring and Manufacturing Co. Wire routing apparatus. 3,944,719, Cl. 174-72.00A.
Rubic, Wayne J.: *See—*
Bittle, James Long; and Rubic, Wayne J., 3,944,469.
Rubin, Albert; and Travis, Benjamin H. Positive acting check valve of polyvinylchloride to open in response to predetermined line pressure. 3,943,969, Cl. 137-538.000.
Ruckel, Erwin Richard, to American Cyanamid Company. Polymeric pinene epoxides and process for preparing the same. 3,944,624, Cl. 260-611.00B.
Rudolph, Frank W.: *See—*
Mead, Ralph T.; Greatbatch, Wilson; and Rudolph, Frank W., 3,944,433.
Rudszinat, Willy: *See—*
Stoffers, Helmut; George, Rudolf; Niemann, Helmut; and Rudszinat, Willy, 3,943,944.
Ruell, Hartwig; and Storck, Eckhard, to Siemens Aktiengesellschaft. Recording unidimensional holograms with reduced positional sensitivity during readout. 3,944,321, Cl. 350-3.500.
Ruf, Dieter: *See—*
Eitel, Hans-Georg; Morlock, Waldemar; and Ruf, Dieter, 3,943,746.
Ruffner, Heinz, to Maag-Gear Wheel & Machine Company Limited. Probe for a gear tester. 3,943,633, Cl. 33-179.50R.
Ruggles, Wesley, Jr.: *See—*
Willcocks, Martin Edmund George, 3,944,735.
Rusbuldt, Horst: *See—*
Holst, Johann; and Rusbuldt, Horst, 3,943,768.

Russell, Robert Schenke: *See—*
Ashton, William Howard; and Russell, Robert Schenke, 3,943,949.
Ruthel, Walter W.; and Evans, Leo G., to Hooker Chemicals & Plastics Corporation. Anode base structure. 3,944,479, Cl. 204-297.00R.
S.R.M. Hydromekanik Aktiebolag: *See—*
Ahlen, Karl Gustav, 3,944,034.
Sabia, Raffaele Antonio: *See—*
Hacker, Joseph Michael; Kaufman, Stanley; Sabia, Raffaele Antonio; Sauer, Earl Salvator; Tidd, Charles Edward, Jr.; and Walker, Raymond, 3,944,717.
Saeki, Keiso: *See—*
Matsukawa, Hiroharu; Saeki, Keiso; and Shimada, Takeo, 3,944,502.
Safe Flight Instrument Corporation: *See—*
Greene, Leonard M., 3,943,764.
Saftran System Corporation: *See—*
Moe, James E.; Peel, Richard V.; and Smith, Richard E., 3,944,173.
Saida, Takashi: *See—*
Miyatsuka, Hajime; Honjo, Satoru; Sawada, Kenichi; and Saida, Takashi, 3,944,682.
Saint-Gobain Industries: *See—*
Kunert, Heinz; Moebs, Heinz; and Sauer, Gerd, 3,945,014.
St. Jean, Norman: *See—*
Ramirez, Ciro, 3,944,971.
Saito, Ariyoshi: *See—*
Yanagida, Tokio; Saito, Ariyoshi; Hosoda, Naoyuki; and Kaneko, Fukuzo, 3,944,414.
Saito, Koetsu; Yano, Tsutomu; and Watanabe, Akinori, to Matsushita Electric Industrial Company, Ltd. Acousto-optic filter. 3,944,335, Cl. 350-161.000.
Saito, Nagao: *See—*
Kuji, Yoichi; Kato, Tuyoshi; and Saito, Nagao, 3,944,478.
Saito, Shigemitsu: *See—*
Tohyama, Shunroku; Jinda, Takuma; Saito, Shigemitsu; Tsuda, Yoshizo; and Shinohara, Satoshi, 3,944,522.
Saito, Tadashi: *See—*
Sakai, Toshimitsu; and Saito, Tadashi, 3,943,799.
Sakai Chemical Industry Co. Ltd.: *See—*
Ito, Hiroshi, 3,943,635.
Sakai Sen-i Kogyo Kabushiki Kaisha: *See—*
Morisaki, Kazuo; and Watanabe, Mikio, 3,944,687.
Sakai, Toshimitsu; and Saito, Tadashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Controls for four-forward-speed automatic transmissions. 3,943,799, Cl. 74-866.000.
Sakamoto, Mitsuhiro, to Aisin Seiki Kabushiki Kaisha. Impact absorber. 3,944,198, Cl. 267-116.000.
Sakamoto, Yoichi: *See—*
Ohtani, Tadoa; Kato, Nobuyuki; Kojima, Shigeru; Sakamoto, Yoichi; Tsukahara, Masaharu; Kojima, Kiyoshi; Konno, Isago; and Kubo, Takao, 3,944,445.
Sakuma, Kenzo: *See—*
Otsuki, Hiroshi; Sakuma, Kenzo; and Matsuzawa, Isamu, 3,944,565.
Sakurai, Yasuhiko: *See—*
Arai, Hiroshi; Watanabe, Yohei; Ohta, Jun; Higo, Nobumasa; and Sakurai, Yasuhiko, 3,944,969.
Salkov, Vladimir Alexandrovich: *See—*
Vainer, Shimon Abramovich; Temerev, Anatoly Fedorovich; Vainer, Savely Abramovich; Nikulin, Sergei Sergeevich; Kheifets, Matvei Evseevich; Usoltsev, Vadim Anatolievich; Matveev, Evgeny Fedorovich; Kazakov, Georgy Petrovich; Salkov, Vladimir Alexandrovich; and Malinin, Anatoly Isidorovich, 3,944,441.
Samcoe Holding Corporation: *See—*
Frezza, Robert, 3,944,149.
Samhammer, Clair A.; Ellsworth, Arthur W.; Sullivan, James P.; Artmann, John A.; and Null, Robert A., to Samsonite Corporation. Luggage case construction. 3,944,032, Cl. 190-41.00B.
Samsonite Corporation: *See—*
Samhammer, Clair A.; Ellsworth, Arthur W.; Sullivan, James P.; Artmann, John A.; and Null, Robert A., 3,944,032.
Samuelson, Hans Olof; Smedman, Leif Ake; and Hagglund, Erik Olof Sture, to Mo och Domsjo Aktiebolag. Pulping of lignocellulosic material with oxygen in two stages at increasing pH. 3,944,463, Cl. 162-65.000.
Sander, Ulrich: *See—*
Dorr, Karl-Heinz; Grimm, Hugo; Sander, Ulrich; Peichl, Robert; and Tacke, Michael, 3,944,401.
Sanders Associates, Inc.: *See—*
Figler, Burton D.; and Nussdorfer, Theodore J., 3,944,167.
Hayner, Paul F., 3,943,957.
Sanders, Raymond J., to British Columbia Research Council. Method and apparatus for launching and recovering submersibles. 3,943,875, Cl. 114-235.00B.
Sandoz, Inc.: *See—*
Houlihan, William J.; and Nadelson, Jeffrey, 3,944,570.
Kitagaki, Tadaharu; Takahashi, Yoshio; and Takita, Kiyoshi, 3,944,664.
Santa Martha Bay Shipping and Trading Co., Ltd.: *See—*
Pratolongo, Modesto, 3,944,678.
Sarges, Reinhard: *See—*
Evanega, George R.; Kuhla, Donald E.; and Sarges, Reinhard, 3,944,524.
Sarkes Tarzian, Inc.: *See—*
Badger, Joe G., 3,944,952.
Busch, Albert E., 3,944,731.
Sartore, James J. A. Case with closeable lid. 3,943,948, Cl. 132-73.000.
Sasaki, Tohru: *See—*
Yoshikawa, Shinsuke; Sasaki, Tohru; and Ichii, Takao, 3,943,614.
Sato, Fukuji, to Satoh Cohki Co., Ltd. Wireless multiflashlight apparatus for a photographic camera. 3,944,877, Cl. 315-241.00P.
Sato, Ikuo: *See—*
Takada, Keisuke; Gamo, Ryouji; and Sato, Ikuo, 3,943,765.
Sato, Kenichi, to Aisin Seiki Kabushiki Kaisha. Power transmitting mechanism. 3,943,798, Cl. 74-682.000.
Sato, Koji: *See—*
Watanabe, Satoshi; and Sato, Koji, 3,945,017.
Sato, Masanori: *See—*
Miyac, Takayuki; Maeda, Hiroaki; and Sato, Masanori, 3,943,715.
Sato, Masayuki, to Nihon Denshi Kabushiki Kaisha. Method and apparatus for processing a video signal from a scanning electron microscope. 3,944,829, Cl. 250-311.000.
Sato, Wasuke; Iriko, Fumio; Yuzawa, Yoshihiko; Takeuchi, Setsuyuki; and Ibe, Nobukuni, to Showa Denko K.K.; and Nissei Plastic Industrial Co., Ltd. Method for manufacturing shaped articles by injection-blow molding. 3,944,643, Cl. 264-97.000.
Satoh Cohki Co., Ltd.: *See—*
Sato, Fukuji, 3,944,877.
Satory, Rodney Jene. Acoustical seal. 3,944,018, Cl. 181-33.00R.
Sauer, Earl Salvator: *See—*
Hacker, Joseph Michael; Kaufman, Stanley; Sabia, Raffaele Antonio; Sauer, Earl Salvator; Tidd, Charles Edward, Jr.; and Walker, Raymond, 3,944,717.
Sauer, Gerd: *See—*
Kunert, Heinz; Moebs, Heinz; and Sauer, Gerd, 3,945,014.
Saunders, Robert M.; and Kohler, George O., to United States of America, Agriculture. Preparation of alpha-amylase inhibitor. 3,944,537, Cl. 260-112.00G.
Saurer A.G.: *See—*
Porter, Allan William Henry, 3,943,979.
Saurer, Eric: *See—*
Portmann, Hubert; Saurer, Eric; and Hersberger, Pierre, 3,943,696.
Sauter, Roland: *See—*
Bauer, Manfred; Kroesche, Herbert; Sauter, Roland; and Stechmann, Helmut, 3,943,695.
Sautner, William J., to Jovill Manufacturing Company. Self-balancing bridge-type proximity detector. 3,944,792, Cl. 235-92.0PK.
Savage, Donald D., to Powell, B. J., a part interest. Tree transporting vehicle. 3,944,097, Cl. 214-514.000.
Savco, Inc.: *See—*
Meyers, William Foulks; and Savinov, Oleg Serge, 3,944,837.
Savinov, Oleg Serge: *See—*
Meyers, William Foulks; and Savinov, Oleg Serge, 3,944,837.
Sawada, Kenichi: *See—*
Miyatsuka, Hajime; Honjo, Satoru; Sawada, Kenichi; and Saida, Takashi, 3,944,682.
Sawchuk, Peter, to Corning Glass Works. Method of forming a hermetic enclosure. 3,943,620, Cl. 29-570.000.
Sayer, Michael, to Canadian Patents & Development Ltd. Thermionic emitter of lanthanum strontium vanadates. 3,944,866, Cl. 313-346.00R.
Scalia, Guiseppe: *See—*
Populin, Peter; Populin, Louis; and Scalia, Guiseppe, 3,943,862.
Scan-Tron Corporation: *See—*
Sokolski, Michael, 3,943,642.
Schaar, Charles H., to Colgate-Palmolive Company. Disposable diaper. 3,943,930, Cl. 128-287.000.
Schaefer, Rudolf Karl: *See—*
Wilczewski, Robert Hugh; and Schaefer, Rudolf Karl, 3,944,155.
Schardt, Richard: *See—*
Broecker, Bernhard; Schardt, Richard; and Werner, Gerhard, 3,944,512.
Scheetz, Joseph M.: *See—*
Bigatel, Alfred I.; Jarrett, Quentin T.; Petskus, Ronald A.; Rowan, David C.; and Scheetz, Joseph M., 3,944,419.
Scheinberg, Samuel, to Atler, Lawrence A., a part interest. Splint and method of applying same. 3,943,923, Cl. 128-89.00R.
Schellenbaum, Max; Duennenberger, Max; and Casagrande, Fulvio, to Ciba-Geigy. Microbicidal agents containing as active ingredient monohydroxyphenyl carbinols. 3,944,652, Cl. 424-345.000.
Schenectady Chemicals, Inc.: *See—*
Bowers, Lewis H.; Jankowski, Raymond E.; and Sullivan, John L., 3,944,510.
Schenk, Peter, to Dzus Fastener Co., Inc. Flush head panel fastener. 3,943,611, Cl. 24-203.00R.
Schenk, Richard, to Stacie Pen Corporation. Retractable writing implement. 3,944,371, Cl. 401-110.000.
Schering Aktiengesellschaft: *See—*
Laurent, Henry; and Wiechert, Rudolf, 3,944,577.
Schering Corporation: *See—*
Steinman, Martin, 3,944,672.
Symchowicz, Samson; and Faro, Hans-Peter, 3,944,675.
Schexnayder, Lawrence F., to Caterpillar Tractor Co. Contaminant removal from a hydraulic cylinder. 3,943,717, Cl. 60-453.000.
Schierding, Royce Gene; Young, John Russell, Jr.; and Vadnais, David Louis, to Monsanto Company. Apparatus for horizontal production of single crystal structure. 3,944,393, Cl. 23-273.0SP.
Schiesterl, Gerhard: *See—*
Wulf, Helmut; and Schiesterl, Gerhard, 3,944,250.

Schlicht, Raymond C.: *See—*
Wiley, Morris A.; Schlicht, Raymond C.; and Waldbillig, James O., 3,944,495.
Schlumberger Technology Corporation: *See—*
Rau, Rama N., 3,944,910.
Schmalbach-Lubeca-werke AG: *See—*
Hexel, Gunter, 3,944,124.
Schmidlin, Albertus E., to United States of America, Army. Fluidic acceleration sensor. 3,943,776, Cl. 73-515.000.
Schmidt, Harald: *See—*
Dubs, Paul; Kuntzel, Heiner; Pesaro, Mario; and Schmidt, Harald, 3,944,561.
Schmucker, Georg, to Telefunken Patentverwertungs-G.m.b.H. Electronic proximity fuse having multiple Doppler frequency channels. 3,945,008, Cl. 343-7.0PF.
Schmunk, John D., to Hancor, Inc. Diverter valve. 3,943,971, Cl. 137-610.000.
Schnabel, Werner, to Siemens Aktiengesellschaft. Method of producing tantalum dry-electrolytic capacitors. 3,944,450, Cl. 156-3.000.
Schneider, Charles: *See—*
Chabardes, Pierre; Grard, Charles; and Schneider, Charles, 3,944,623.
Schnittker, William E., to Emerson Electric Co. Solenoid operated pilot controlled valve. 3,943,975, Cl. 137-630.140.
Schoenberg, Jules E.; and Ray-Chaudhuri, Dilip K., to National Starch and Chemical Corporation. Alkaline curing corrugating adhesive. 3,944,428, Cl. 106-213.000.
Schoeppel, Roger J.: *See—*
Terry, Lynn E.; and Schoeppel, Roger J., 3,943,719.
Schonherr, Werner: *See—*
Jagusch, Leonhard; Schonherr, Werner; and Weiske, Dieter, 3,944,406.
Schook, Omer H.: *See—*
Wolski, Francis; and Zaremskas, Alan A., 3,943,804.
Schoppee, Lawrence W.; and D'Antonio, Alfred, to Package Machinery Company. Rotary tab cutter. 3,943,809, Cl. 83-311.000.
Schram, Cornelis W. A.; and Wattimena, Freddy, to Shell Oil Company. Hydrogenolysis of phenyl alkyl ketones and 1-phenylalkanols. 3,944,627, Cl. 260-668.00R.
Schraud, Alfred; and Gottschalk, Karl-Heinz. Process for the shrinking and structure developments of textile webs and the like. 3,943,613, Cl. 28-76.00R.
Schreckendgust, Jay G., to Sybron Corporation. Method and apparatus for sterilizing with a heavier-than-air gas. 3,944,387, Cl. 21-58.000.
Schroeder, Wilburn C. Production of oil and high Btu gas from coal. 3,944,480, Cl. 208-10.000.
Schubert, Christoph: *See—*
Molter, Gunther; and Schubert, Christoph, 3,944,087.
Schubert & Salzer Maschinenfabrik Aktiengesellschaft: *See—*
Lubitzsch, Wolfgang, 3,943,805.
Schuette, Thomas J.; and Turnbough, Harold L., to Alvey, Inc. Article propelling mechanism for conveying apparatus. 3,944,057, Cl. 198-160.000.
Schukin, Mikhail Ivanovich: *See—*
Apsit, Voldemar Voldemarovich; Dombur, Lev Eduardovich; Lutsavs, Yan Yanovich; Pugachev, Vladislav Alexandrovich; Schukin, Mikhail Ivanovich; Dirzhis, Sauljus Antanovich; Karosas, Iozas Ionovich; Pashtukas, Algis Vladislavovich; and Khlavnovich, Leonid Borisovich, 3,944,863.
Schuldenberg, Franz J.; and Gerz, Hans-Bernd, to GEA Luftkuehlergesellschaft Happel GmbH & Co. KG. Cooling tower. 3,944,636, Cl. 261-159.000.
Schulz, Hansrichard: *See—*
Hummel, Herbert; and Schulz, Hansrichard, 3,943,700.
Schulze, Heinz: *See—*
Hahn, Werner; Schulze, Heinz; and Walther, Bernhard, 3,944,154.
Schulze, Martin: *See—*
Schwall, Fritz; Preusser, Gerhard; and Schulze, Martin, 3,944,483.
Schumacher, Walter C. AC switch with cantelever contact and balance springs. 3,944,773, Cl. 200-293.000.
Schumag Schumacher Metallwerke Gesellschaft mit beschrankter Haftung: *See—*
Wetzels, Walter; Greven, Johann; Romer, Wilhelm; and Hoppe, Heinz, 3,943,743.
Schutz, Manfred: *See—*
Grafwallner, Franz; and Schutz, Manfred, 3,943,706.
Schwall, Fritz; Preusser, Gerhard; and Schulze, Martin, to Krupp-Koppers GmbH. Distillative recovery of aromatics with water addition in azeotropic proportions. 3,944,483, Cl. 208-321.000.
Schwan, Thomas J., to Morton-Norwich Products, Inc. 5-Substituted-2,4-diphenylpyrimidines. 3,944,581, Cl. 260-251.00R.
Schwartz, Joseph I.: *See—*
Hering, Frederic S.; and Schwartz, Joseph I., 3,943,873.
Schwartzkopf, Glen E., to Caterpillar Tractor Co. Recoil spring housing assembly. 3,944,196, Cl. 267-4.000.
Schwarzenbach, Kurt; and Brunetti, Heimo, to Ciba-Geigy Corporation. Phosphoric acid anilides. 3,944,632, Cl. 260-926.000.
Schweitzer, Robert F.: *See—*
Kilby, Jack S.; Schweitzer, Robert F.; and McCrady, John, 3,944,724.
Schweizer, Hanspeter: *See—*
Kane, James; and Schweizer, Hanspeter, 3,944,684.
Schwieter, Ulrich: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,944,531.
Science-Union et Cie: *See—*
Regnier, Gilbert; Canevari, Roger; Laubie, Michel; and Poignantw, Jean-Claude, 3,944,551.
SCM Corporation: *See—*
Bonsack, James Paul, 3,944,647.
Mueller, Hans W.; and Lamey, Cornel L., 3,944,041.
Scott, Donald W.: *See—*
Fisher, John B.; and Scott, Donald W., 3,943,643.
Scott, Douglas E.: *See—*
Johnson, Richard A.; and Scott, Douglas E., 3,944,892.
Scott-Fisher Development Company: *See—*
Fisher, John B.; and Scott, Donald W., 3,943,643.
Scott Paper Company: *See—*
Hakanson, Nils L.; and Touchette, Albert F., 3,944,367.
Seales, Alan, to Signetics Corporation. Semiconductor structure having contact openings with sloped side walls. 3,945,030, Cl. 357-52.000.
Seib, Kenneth L.: *See—*
Holmes, Thomas G.; and Seib, Kenneth L., 3,944,977.
Seifried, Paul, to Rheinmetall GmbH. Cartridge chamber for automatic firearm. 3,943,821, Cl. 89-16.000.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Nakamura, Tsugio, 3,944,282.
Sellstedt, John H.: *See—*
Teller, Daniel M.; Sellstedt, John H.; and Guinosso, Charles J., 3,944,580.
Selting, Wayne J.: *See—*
Bhaskar, Surindar N.; Selting, Wayne J.; Gilmore, Eleanor L.; and Gross, Arthur, 3,943,592.
Sennari, Mutsuo; Izumi, Yoichiro; and Fujita, Taketoshi, to Mitsubishi Petrochemical Company Limited. Gaseous-phase polymerization of olefins. 3,944,534, Cl. 260-93.700.
Serrallonga Vilaseca, Hilario, to Maquinaria Textil Del Norte De Espana S.A.-Matesa. Continuous insertion weaving machine. 3,943,976, Cl. 139-12.000.
Severson, Gerald R., to Motorola, Inc. Intracranial pressure sensing device. 3,943,915, Cl. 128-2.00P.
Sexstone, John H., to Brown & Williamson Tobacco Corporation. Method and apparatus for the handling of tow in the manufacture of tobacco smoke filters containing particulate material. 3,943,832, Cl. 93-1.00C.
Sharp, Russell G.: *See—*
Reed, Charles C.; Sharp, Russell G.; and Cooley, Denton A., 3,944,261.
Sharpe, Robert E.: *See—*
Brockway, M. Clifford; and Sharpe, Robert E., 3,944,100.
Shaw-Walker Company, The: *See—*
Hansen, Harland W., 3,944,080.
Shea, Donald Ray: *See—*
Burns, Thomas Victor; and Shea, Donald Ray, 3,944,746.
Sheely, Harold R., to Badger Company, Inc., The. Method of producing unsaturated nitriles. 3,944,592, Cl. 260-465.300.
Shell Oil Company: *See—*
Miller, Alexander, Jr.; and Morales, Juan G., 3,944,662.
Schram, Cornelis W. A.; and Wattimena, Freddy, 3,944,627.
Shepard, Wayland L., to General Electric Company. Voice-operated switching circuit for a video communications system. 3,944,736, Cl. 179-1.0VC.
Sher, Jay: *See—*
Smith, Melvin F., Jr.; and Sher, Jay, 3,944,021.
Sherwin-Williams Company, The: *See—*
Moonan, William; and Czarnecki, John D., 3,944,115.
Sherwood, John R., to AMF Incorporated. Produce grader. 3,944,819, Cl. 250-226.000.
Shida, Tomohiko: *See—*
Umino, Tomio; Suzuki, Munenobu; and Shida, Tomohiko, 3,944,779.
Shiga, Mikio: *See—*
Takahara, Hiroyasu; Morishita, Isao; Shiga, Mikio; and Uchijima, Toshikatsu, 3,944,679.
Shimada, Shozo, to Shimano Industrial Company Limited. Operating mechanism for a bicycle. 3,943,794, Cl. 74-501.50R.
Shimada, Takeo: *See—*
Matsukawa, Hiroharu; Saeki, Keiso; and Shimada, Takeo, 3,944,502.
Shimadzu Seisakusho, Ltd.: *See—*
Kita, Yasuo, 3,943,826.
Shimakawa, George, to Kabushiki Kaisha Suwa Seikosha. Numeric display configuration. 3,945,001, Cl. 340-336.000.
Shimano Industrial Company Limited: *See—*
Shimada, Shozo, 3,943,794.
Shimizu, Kenichi: *See—*
Hirota, Ryuichi; Kakuta, Hisashi; Motoba, Shigetado; Shimizu, Kenichi; Kanno, Ryoichi; and Narita, Mitsuaki, 3,944,650.
Shimizu, Nobuaki: *See—*
Honna, Kosaku; Shimizu, Nobuaki; and Kurisaki, Konomu, 3,944,626.
Shimoi, Akio; Oguchi, Kikuo; and Ogata, Toshiaki, to Kabushiki Kaisha Suwa Seikosha. X-cut quartz resonator using non overlaping electrodes. 3,944,862, Cl. 310-9.800.
Shindler, Anthony, to American Optical Corporation. Polarizing spectacles. 3,944,346, Cl. 351-49.000.
Shine, Jerry Paul. Fishingline sinker. 3,943,654, Cl. 43-43.140.
Shinohara, Satoshi: *See—*
Tohyama, Shunroku; Jinda, Takuma; Saito, Shigemitsu; Tsuda, Yoshizo; and Shinohara, Satoshi, 3,944,522.

Shinomiya, Tokuo: *See—*
Osajima, Yoshihiro; Imao, Syoji; Shinomiya, Tokuo; Mihara, Sirou; and Edamatsu, Michisuke, 3,944,639.
Shiota, Takizo; and Mogi, Takao, to Sony Corporation. Numeric character indicator. 3,943,881, Cl. 116-124.10R.
Shmakov, Eduard Ivanovich: *See—*
Paton, Boris Evgenievish; Dudko, Daniil Andreevich; Gvozdetsky, Vasily Stepanovich; Asoyants, Grigory Bagradovich; Sklyarevsky, Vladik Efimovich; Skrypnik, Valentin Ivanovich; and Shmakov, Eduard Ivanovich, 3,944,780.
Shoberg, Ralph S.; and Kozlowski, Kenneth R. Cable tension tester and control system. 3,943,761, Cl. 73-144.000.
Short, Joe T.; Knight, Lee H., Jr.; Frentress, Zane; and Boteler, Winston C., to Deering Milliken Research Corporation. Controlled delivery of yarn. 3,943,865, Cl. 112-79.00R.
Showa Denko K.K.: *See—*
Sato, Wasuke; Iriko, Fumio; Yuzawa, Yoshihiko; Takeuchi, Setsuyuki; and Ibe, Nobukuni, 3,944,643.
Shoyama, Hirozi: *See—*
Usami, Noboru; Sodeyama, Chuichi; and Shoyama, Hirozi, 3,944,931.
Shtanko, Jury Pavlovich; Baglai, Vitaly Mikhailovich; Medovar, Boris Izrailevich; Stupak, Leonid Mikhailovich; Pavliichuk, Georgy Anatolievich; and Bogachenko, Alexei Georgievich. Electroslag remelting plant. 3,944,714, Cl. 13-9.0ES.
Shuman, Richard F.: *See—*
Tull, Roger J.; Czaja, Robert F.; Shuman, Richard F.; and Pines, Seemon H., 3,944,600.
Shuster, Edward J.: *See—*
Mookherjee, Braja Dulal; Kamath, Venkatesh; and Shuster, Edward J., 3,944,621.
Sibeud, Jean-Paul. Method and device for ascertaining the state of a gear box, in particular in a motor vehicle. 3,943,792, Cl. 74-473.00R.
Sibley, Murray J.: *See—*
Hramchenko, Jack; and Sibley, Murray J., 3,944,506.
Siclari, Anthony. Patty maker. 3,943,602, Cl. 17-32.000.
Siczek, Bernard, to Graco Inc. Spray gun shield and trigger safety apparatus. 3,944,141, Cl. 239-288.500.
Siebe Gorman & Company Limited: *See—*
Simpson, Keith; and Maggs, Frederick Arthur Pomroy, 3,944,403.
Siebenrock, Howard D.: *See—*
Benwood, Bruce R.; and Siebenrock, Howard D., 3,944,354.
Sieber, Peter: *See—*
Iselin, Beat; and Sieber, Peter, 3,944,590.
Siegenthaler, Peter, to Carba Limited. Apparatus for humidifying a gas. 3,944,635, Cl. 261-62.000.
Siemens Aktiengesellschaft: *See—*
Beckmann, Oskar; Habock, Adolf; and Leowald, Karl-Friedrich, 3,944,815.
Brunner, Anton; and Willburger, Nikolaus, 3,945,013.
Distler, Walter, 3,945,022.
Drax, Heinz; and Stut, Hans, 3,944,737.
Groppel, Dieter; and Siemsen, Gisela, 3,944,434.
Kohler, Werner, 3,944,771.
Kraus, Helmut; and Distler, Walter, 3,945,020.
Kraus, Helmut; and Wiesmuller, Siegfried, 3,945,021.
Landgraf, Hermann, 3,943,919.
Larsen, Herbert, 3,944,327.
Ruell, Hartwig; and Storck, Eckhard, 3,944,321.
Schnabel, Werner, 3,944,450.
Siemens Electrogerate GmbH: *See—*
Detterbeck, Heinrich, 3,944,786.
Siemsen, Gisela: *See—*
Groppel, Dieter; and Siemsen, Gisela, 3,944,434.
Sietmann, Vernon H.; Keese, Larry S.; and Smith, Raymond L. Apparatus for drying grain. 3,943,636, Cl. 34-44.000.
Sigmond, Gyorgy? *See—*
Solymar, Karoly; Zambo, Janos; Orban nee Kelemen, Marika; Bujdoso, Erno; Feher, Ivan; Ozvald, Zoltan; Voros, Istvan; Ferenczi, Tibor; Toth, Pal; Lazar, Ferenc; Pinter, Tihamer; Sigmond, Gyorgy; Siklosi, Peter; Wentzely, Kalman; Lengyel, Laszlo; and Matyasi, Jozsef, 3,944,648.
Signet Controls, Inc.: *See—*
Clinton, William D., 3,943,772.
Signetics Corporation: *See—*
Seales, Alan, 3,945,030.
Signode Corporation: *See—*
Kurcz, Joseph F., 3,944,712.
Siklosi, Peter: *See—*
Solymar, Karoly; Zambo, Janos; Orban nee Kelemen, Marika; Bujdoso, Erno; Feher, Ivan; Ozvald, Zoltan; Voros, Istvan; Ferenczi, Tibor; Toth, Pal; Lazar, Ferenc; Pinter, Tihamer; Sigmond, Gyorgy; Siklosi, Peter; Wentzely, Kalman; Lengyel, Laszlo; and Matyasi, Jozsef, 3,944,648.
Simes Societa Italiana Medicinali e Sintetici S.p.A.: *See—*
Ferrari, Giorgio; and Krepinsky, Jiri Jan, 3,944,582.
Simmonds, James F., to Perkins Research and Manufacturing Co. Fault detection method and apparatus for multiconductor cables. 3,944,914, Cl. 324-51.000.
Simon, Frank N., to Honeywell Inc. Solid state viscosimeter. 3,943,753, Cl. 73-54.000.
Simon, Myron S.: *See—*
Bloom, Stanley M.; Idelson, Elbert M.; Simon, Myron S.; and Waller, David P., 3,944,569.
Simpson, Keith; and Maggs, Frederick Arthur Pomroy, to Siebe Gorman & Company Limited. Adsorptive devices. 3,944,403, Cl. 55-316.000.
Simpson, Lee S. Rack for stowing leaders. 3,943,655, Cl. 43-57.50R.
Simpson, Robert D.: *See—*
Boone, Jimmie H.; and Simpson, Robert D., 3,944,171.
Sims, James B.: *See—*
Sutton, Walter T., Jr.; and Sims, James B., 3,944,870.
Simson, Earl G. Bag handle. 3,944,033, Cl. 190-57.000.
Singh, Balwant, to American Cyanamid Company. Synthesis of N-[1-(chloromethyl)propyl]acetamide. 3,944,608, Cl. 260-561.0HL.
Singh, Balwant, to American Cyanamid Company. Synthesis of dl-2-amino-1-butanol. 3,944,617, Cl. 260-584.00R.
Singh, Balwant, to American Cyanamid Company. Synthesis of ethambutol. 3,944,618, Cl. 260-584.00R.
Singh, Balwant, to American Cyanamid Company. Synthesis of d-2-amino-1-butanol. 3,944,619, Cl. 260-584.00R.
Singleton, Albert. Door opening and closing apparatus for tumbling barrel. 3,944,189, Cl. 259-89.000.
Sivash, Konstantin Mitrofanovich. Artificial hip joint made from two different surgical alloys. 3,943,576, Cl. 3-1.000.
Sivy, William H.: *See—*
Standbridge, Wilbur R.; Butler, Larry D.; and Sivy, William H., 3,943,844.
Siwko, Karol: *See—*
Arumugham, Rangaswamy; Kruszewski, William Frank; and Siwko, Karol, 3,944,725.
Skelly, Peter T.: *See—*
Proctor, Darryl F.; Skelly, Peter T.; and Champan, Louis W., 3,944,753.
SKF Industrial Trading and Development Company B.V.: *See—*
Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, 3,944,011.
SKF Nova AB: *See—*
Asberg, Sture Lennart, 3,944,305.
Skidmore-Wilhelm Mfg. Co.: *See—*
Wilhelm, John W., Jr., 3,943,757.
Skil Corporation: *See—*
Gloviak, Tom J., 3,943,782.
Skinner, Robert Thomas John, to C. A. V. Limited. Fuel injection pumping apparatus. 3,943,902, Cl. 123-139.0AQ.
Skinner, Robert Thomas John, to C. A. V. Limited. Liquid fuel injection pumping apparatus. 3,943,903, Cl. 123-139.00R.
Sklyarevsky, Vladik Efimovich: *See—*
Paton, Boris Evgenievish; Dudko, Daniil Andreevich; Gvozdetsky, Vasily Stepanovich; Asoyants, Grigory Bagradovich; Sklyarevsky, Vladik Efimovich; Skrypnik, Valentin Ivanovich; and Shmakov, Eduard Ivanovich, 3,944,780.
Skobel, Max, to Dow Corning Corporation. Method and apparatus for applying reinforced insulation to a conductor. 3,944,459, Cl. 156-461.000.
Skorianetz, Werner: *See—*
Becker, Joseph J.; Hochstrasser, Ulrich P.; and Skorianetz, Werner, 3,944,620.
Skrypnik, Valentin Ivanovich: *See—*
Paton, Boris Evgenievish; Dudko, Daniil Andreevich; Gvozdetsky, Vasily Stepanovich; Asoyants, Grigory Bagradovich; Sklyarevsky, Vladik Efimovich; Skrypnik, Valentin Ivanovich; and Shmakov, Eduard Ivanovich, 3,944,780.
Sloan, Donald D., to Dennison Manufacturing Company. Microelectrophotographic method. 3,944,418, Cl. 96-1.00R.
Slocombe, Robert J., to B. F. Goodrich Company, The. Low temperature synthetic rubber and method of making same. 3,944,535, Cl. 260-94.300.
Smedman, Leif Ake: *See—*
Samuelson, Hans Olof; Smedman, Leif Ake; and Hagglund, Erik Olof Sture, 3,944,463.
Smith, Bruce E.: *See—*
Borg, Arthur N.; and Smith, Bruce E., 3,945,003.
Smith, Ernest L., to Phillips Petroleum Company. Container and blank. 3,944,130, Cl. 229-37.00R.
Smith International, Inc.: *See—*
Neilson, William J., 3,944,306.
Smith, John A. Decorative assembly or toy. 3,944,691, Cl. 428-13.000.
Smith, Kendall O. Low temperature storage of surface attached living cell cultures. 3,943,993, Cl. 165-2.000.
Smith, Lawrence Edward: *See—*
Henley, Michael Lee; and Smith, Lawrence Edward, 3,944,883.
Smith, Leslie Harold, to Imperial Chemical Industries Limited. Nitrogen-containing compounds. 3,944,611, Cl. 260-562.00R.
Smith, Lester E.; and Kilbourn, Dean R., to Olin Corporation. Inflating device for use with vehicle safety systems. 3,944,249, Cl. 280-150.0AB.
Smith, Melvin F., Jr.; and Sher, Jay, to Smith, Melvin F., Jr.; Sher, Jay; and Brown, Herbert, part interest to each. Emergency escape mechanism. 3,944,021, Cl. 182-3.000.
Smith, Raymond L.: *See—*
Sietmann, Vernon H.; Keese, Larry S.; and Smith, Raymond L., 3,943,636.
Smith, Richard E., to Xerox Corporation. Hybrid crossmixer. 3,943,887, Cl. 118-637.000.
Smith, Richard E.: *See—*
Moe, James E.; Peel, Richard V.; and Smith, Richard E., 3,944,173.

Smith, Verity C.; and Reynolds, Lawrence H., to Vaponics, Inc. Method of coupling, and fitting for, lined tubing. 3,943,616, Cl. 29-157.00R.

SmithKline Corporation: *See—*
Sutton, Blaine M.; Walz, Donald T.; and Wilson, James W., 3,944,571.

Smits, Petrus: *See—*
van Pelt, Johannes George; Prins, Albertus; van Roon, Johannes Hendrik; and Smits, Petrus, 3,944,680.

Smugor, Carl D. Adapter for indicating on wall panels and the like the location of electrical receptacle boxes or the like. 3,943,631, Cl. 33-174.00G.

Snelling, Christopher; Little, William S.; and Townsend, Robert H., to Xerox Corporation. Background reduction. 3,944,353, Cl. 355-3.00P.

Snow Brand Milk Products Co., Limited: *See—*
Handa, Makoto; and Hayashi, Hiromichi, 3,943,771.

Sobanski, Edward Walter, to Western Electric Company. Circuitry for providing call override in a PBX system. 3,944,750, Cl. 179-18.0BH.

Societe Anonyme dite B.T.B. Benoit le Tapis Brosse: *See—*
Partensky, Pierre Jean Marc, 3,944,451.

Societe Avions Marcel Dassault -Brequet Aviation: *See—*
Pierrat, Jean Joseph Henri, 3,944,821.

Societe D'Etudes, Recherches Et Constructions Electroniques Sercel: *See—*
Lacorre, Jean; and Champenois, Michel, 3,944,902.

Societe Fulmen: *See—*
Gaide, Rene, 3,944,436.

Societe Industrielle de Brevets et D'Etudes S.I.B.E.: *See—*
Kluth, Wilhelm, 3,943,907.

Societe Lannionnaise d'Electronique Sle-Citerel: *See—*
Le Mouel, Bernard, 3,944,939.

Soderlund, Gunnar M.: *See—*
Buscher, Richard George; and Soderlund, Gunnar M., 3,944,974.

Soderquist, Douglas R.: *See—*
Thom, Le Roy W.; Eldred, Rodney D.; and Soderquist, Douglas R., 3,944,007.

Sodeyama, Chuichi: *See—*
Usami, Noboru; Sodeyama, Chuichi; and Shoyama, Hirozi, 3,944,931.

Soin, Jury Konstantinovich: *See—*
Polyanin, Valery Andreevich; Berkovich, Anatoly Jurievich; Zabegalov, Georgy Vasilievich; and Soin, Jury Konstantinovich, 3,944,089.

Sokolski, Michael, to Scan-Tron Corporation. Trim marks of equilateral triangular shape. 3,943,642, Cl. 35-48.00R.

Sollak, Johann; and Waczek, Otto, to Gertsch AG. Device for adjusting and indicating the relative position of ski binding components. 3,943,882, Cl. 116-124.00R.

Solomon, Richard A., to Dow Chemical Company, The. Detection of chloromethyl methyl ether or bis-chloro-methyl ether. 3,944,389, Cl. 23-230.00R.

Soloveichik, Yakov Girshevich: *See—*
Misulovin, Leonid Yakovlevich; Panin, Igor Ivanovich; Soloveichik, Yakov Girshevich; Kovalev, Leonid Anisimovich; and Zhoglo, Viktor Olimpievich, 3,944,956.

Solvay & Cie.: *See—*
Verlaeten, Jean, 3,944,474.

Solymar, Karoly; Zambo, Janos; Orban nee Kelemen, Marika; Bujdoso, Erno; Feher, Ivan; Ozvald, Zoltan; Voros, Istvan; Ferenczi, Tibor; Toth, Pal; Lazar, Ferenc; Pinter, Tihamer; Sigmond, Gyorgy; Siklosi, Peter; Wentzely, Kalman; Lengyel, Laszlo; and Matyasi, Jozsef, to Vallalat, Aluterv Aluminiumipari Tervezo; Intezet, Femipari Kutato; and Timfoldgyar, Almasfuzitoi. Method for processing bauxites. 3,944,648, Cl. 423-121.000.

Sonessa, Joseph P. Bed frame arrangement. 3,943,584, Cl. 5-299.000.

Sonobe, Noriyoshi: *See—*
Kajiwara, Toshiyuki; and Sonobe, Noriyoshi, 3,943,742.

Sony Corporation: *See—*
Kaneko, Masayasu; Ohshima, Syunji; and Asanuma, Yasuaki, 3,944,930.
Mogi, Takao; and Okada, Hisao, 3,944,982.
Ogawa, Yoshio, 3,944,734.
Oki, Ryuji, 3,944,908.
Shiota, Takizo; and Mogi, Takao, 3,943,881.
Suzuki, Masao, 3,944,879.
Takahashi, Shigenori, 3,944,882.
Tsuda, Akira, 3,944,941.

Sorenson, Fred M.: *See—*
Grenfell, James W.; Sorenson, Fred M.; Ueno, Hiroshi; and Miyahara, Masato, 3,943,914.
Ueno, Hiroshi; Grenfell, James W.; Sorenson, Fred M.; and Hozumi, Kazuo, 3,943,629.

Southern California Edison Company: *See—*
Thompson, Maxwell A.; and Ning, Tak S., 3,944,846.

Spaepen, Gustaaf Frans Josef; and Vandenborre, Jan-Baptist Hugo, to Studiecentrum Voor Kernenergie, S.C.K. Method for influencing an electrocatalytic reaction proceeding at an electrode. 3,944,473, Cl. 204-79.000.

Sparber, Frederick J. Heat distributing tanks for retarding surface freezing. 3,943,889, Cl. 119-73.000.

Sparling, Robert H., to Raymond Lee Organization, Inc., The, a part interest. Electric load restriction unit. 3,944,885, Cl. 317-9.00R.

Specialty Products Development Corporation: *See—*
Lynch, Robert W., 3,944,251.

Speck, Morris E.: *See—*
Cardwell, Charles G.; and Speck, Morris E., 3,944,070.

Spectradyne, Inc.: *See—*
Cunningham, Paul M., 3,944,742.

Sperling, Charles A. Ball holder. 3,943,989, Cl. 150-52.00R.

Sperry Rand Corporation: *See—*
Rowland-Hill, Edward W., 3,943,939.

Spickler, Joseph William: *See—*
Rasor, Ned S.; and Spickler, Joseph William, 3,943,936.

Spivack, John D.: *See—*
Kleiner, Eduard K.; and Spivack, John D., 3,944,594.

Sponer, Gisbert: *See—*
Winter, Werner; Thiel, Max; Stach, Kurt; Roesch, Egon; and Sponer, Gisbert, 3,944,566.

Spotz, Donald R. Water jet cleaning appliance. 3,943,951, Cl. 134-100.000.

Sprenkle, George J.; and Cicero, David A., to Burroughs Corporation. Printed circuit card interface apparatus. 3,944,311, Cl. 339-45.00M.

Sprung, Arnold: *See—*
Hastings, Bernard Lyle; and Sprung, Arnold, 3,944,239.

Square D Company: *See—*
Oster, Clark L., 3,944,953.

SSP Agricultural Equipment, Inc.: *See—*
Butler, Donald E., 3,944,139.

Staar Development Company, S.A.: *See—*
Staar, Marcel Jules Helene, 3,945,040.

Staar, Marcel Jules Helene, to Staar Development Company, S.A. Push-push locking and release mechanism for tape cartridge players. 3,945,040, Cl. 360-137.000.

Stach, Kurt: *See—*
Winter, Werner; Thiel, Max; Stach, Kurt; Roesch, Egon; and Sponer, Gisbert, 3,944,566.

Stacie Pen Corporation: *See—*
Schenk, Richard, 3,944,371.

Stamicarbon, B.V.: *See—*
Creemers, Henricus M. J. C., 3,944,529.
de Rooij, Abraham H.; Elmendorp, Jan; and Wassen, Willem J., 3,944,542.
Goettsch, Reijer; and De Rooij, Abraham H., 3,944,543.

Stampone, Peter A., to Tuff Manufacturing Co., Inc. Track pad for asphalt paving machine. 3,944,296, Cl. 305-35.00R.

Standard Oil Company: *See—*
Czajka, Thomas S., 3,944,706.
Kuhlmann, George E., 3,944,601.

Standard Products Company, The: *See—*
Ungerer, Aaron J., 3,944,693.

Standbridge, Wilbur R.; Butler, Larry D.; and Sivy, William H., to Ann Arbor Baler Company. Baling machine. 3,943,844, Cl. 100-53.000.

Stange, Klaus K.; and Strobel, Erwin J., Jr., to Xerox Corporation. Sheet reversing mechanism. 3,944,212, Cl. 271-9.000.

Staniek, Sabina Barbara Kopycinska. Non-aqueous cleaning composition. 3,944,499, Cl. 252-167.000.

Stanley, Conrad, Jr. Front loading utility knife. 3,943,627, Cl. 30-151.000.

Staples, Crawford E., to Westinghouse Air Brake Company. Vehicle movement control system for railroad terminals. 3,944,986, Cl. 340-172.500.

Starkweather, Gary K., to Xerox Corporation. Variable spot size scanning system. 3,944,323, Cl. 350-7.000.

Starrett, Paul D., to Monadnock Lifetime Products, Inc. Police club. 3,944,226, Cl. 273-84.000.

Stauffer Chemical Company: *See—*
Yu, Arthur J.; and Gallagher, Ruth E., 3,944,631.

Stauffer, Norman L., to Honeywell Inc. Auto-focus camera with solid state range finder. 3,945,023, Cl. 354-25.000.

Stearley, John W.: *See—*
Hild, Henry F.; and Stearley, John W., 3,944,315.

Stearn, Theodore; and De Luca, Paul V., to Porta Systems Corporation. Telephone line status indicator. 3,944,752, Cl. 179-81.00C.

Stease, Ralph E. Rail structure for a conveyor. 3,944,037, Cl. 193-35.0TE.

Stechmann, Helmut: *See—*
Bauer, Manfred; Kroesche, Herbert; Sauter, Roland; and Stechmann, Helmut, 3,943,695.

Stedman, Robert N., to Caterpillar Tractor Co. Collapsible steering wheel column. 3,943,793, Cl. 74-492.000.

Stedman, Robert N., to Caterpillar Tractor Co. Adjustable sprocket drive for track-type vehicles and method for using the same. 3,944,297, Cl. 305-57.000.

Steelcase Inc.: *See—*
Keeler, Robert A., 3,944,280.

Steinberg, Richard W.; McClocklin, Samuel B.; and Kostelecky, Clarence L., to Owatonna Tool Company. Waste compactor. 3,943,843, Cl. 100-51.000.

Steinke, John J.: *See—*
Colodney, Daniel; Steinke, John J.; and Mitchell, Robert, 3,944,661.

Steinman, Martin, to Schering Corporation. Method for treating microbial infections. 3,944,672, Cl. 424-274.000.

Stempeck, John W., to Polaroid Corporation. Exposure control system. 3,945,025, Cl. 354-29.000.

Sterne, Karl E., to Optical Sciences Group. Transparent sign display for superimposing transparent sign with printed message on background display. 3,943,648, Cl. 40-106.510.

Stewart, Robert D.; and McKinley, John R., to Occidental Petroleum Corporation. Process for preparing high purity antimony trichloride and antimony oxide from stibnite ores. 3,944,653, Cl. 423-491.000.

Stiga AB: *See*—
Nilsson, Thomas, 3,944,227.

Stiner, Roy E.; and Gardner, Robert P., to Continental Industries, Inc. Insulated meter riser. 3,944,262, Cl. 285-53.000.

Stockmann, Helmut; and Jakobs, Willy, to Klockner-Humboldt-Deutz Aktiengesellschaft. Crusher gap setting by ultrasonic measurement. 3,944,146, Cl. 241-30.000.

Stoffers, Helmut; George, Rudolf; Niemann, Helmut; and Rudszinat, Willy, to Hauni-Werke Korber & Co. KG. Apparatus for making and separating wrapped cigar bunches. 3,943,944, Cl. 131-59.000.

Stokes, Kenneth B.: *See*—
King, Wendell L.; and Stokes, Kenneth B., 3,943,937.

Stone, Wayne B., Jr.; and Beaumont, Alan. Tape cartridge including edge marked magnetic tape. 3,943,879, Cl. 116-67.00A.

Storck, Eckhard: *See*—
Ruell, Hartwig; and Storck, Eckhard, 3,944,321.

Storey, Robert C.: *See*—
Jadwin, Thomas A.; and Storey, Robert C., 3,944,493.

Stotts, Larry B., to United States of America, Navy. High speed optical matrix multiplier system. 3,944,820, Cl. 250-227.000.

Strauss, Leopold, to Indian Head Inc. Bottle conveyor system including adjustable height continuous belt conveyor and positive lock spray shielded rotatable bottle carrier. 3,944,058, Cl. 198-179.000.

Strobel, Erwin J., Jr.: *See*—
Stange, Klaus K.; and Strobel, Erwin J., Jr., 3,944,212.

Stroezel, Reinhold. Gyratory sander. 3,943,669, Cl. 51-170.0MT.

Stucker, Erwin: *See*—
Wolf, Helmut; Bohm, Wolfgang; and Stucker, Erwin, 3,943,758.

Studiecentrum Voor Kernenergie, S.C.K.: *See*—
Spaepen, Gustaaf Frans Josef; and Vandenborre, Jan-Baptist Hugo, 3,944,473.

Stuhr, Hans-Waldemar, to Linde Aktiengesellschaft. Control system for an internal-combustion engine and stepless transmission system. 3,943,712, Cl. 60-327.000.

Stumpf, Karl. End member for driven rollers of roller conveyors. 3,944,055, Cl. 198-127.00R.

Stupak, Leonid Mikhailovich: *See*—
Shtanko, Jury Pavlovich; Baglai, Vitaly Mikhailovich; Medovar, Boris Izrailevich; Stupak, Leonid Mikhailovich; Pavliichuk, Georgy Anatolievich; and Bogachenko, Alexei Georgievich, 3,944,714.

Stut, Hans: *See*—
Drax, Heinz; and Stut, Hans, 3,944,737.

Subsea Equipment Associates, Ltd.: *See*—
Pennock, Michael Derek, 3,943,725.

Suchy, Milos: *See*—
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,944,531.

Sud-Chemie AG: *See*—
Dorr, Karl-Heinz; Grimm, Hugo; Sander, Ulrich; Peichl, Robert; and Tacke, Michael, 3,944,401.

Suezawa, Masaaki: *See*—
Okada, Akira; Izumi, Ryoji; Ninomiya, Syogo; Tahara, Yukio; Takehara, Yuji; Suezawa, Masaaki; and Kawasaki, Kazuhiro, 3,944,144.

Sugihara, Kunihiko: *See*—
Nagumo, Shin-ichi; Nakajima, Yasuo; Hayashi, Yoshimasa; and Sugihara, Kunihiko, 3,943,711.

Sugita, Yasunori; and Itagaki, Yasuhiko, to Mitsui Toatsu Chemicals, Incorporated. Article made of propylene-ethylene copolymer. 3,944,530, Cl. 260-88.250.

Sugiura, Susumu, to Tokico Ltd. Actuating force generating device. 3,943,830, Cl. 92-63.000.

Sullivan, James P.: *See*—
Samhammer, Clair A.; Ellsworth, Arthur W.; Sullivan, James P.; Artmann, John A.; and Null, Robert A., 3,944,032.

Sullivan, John L.: *See*—
Bowers, Lewis H.; Jankowski, Raymond E.; and Sullivan, John L., 3,944,510.

Sullivan, John P., Jr., to Itek Corporation. Gelable and gelled compositions. 3,944,427, Cl. 106-208.000.

Sulzer Brothers Limited: *See*—
Purtschert, Werner, 3,944,304.

Sumitomo Electric Industries, Ltd.: *See*—
Doi, Kaname; and Nagara, Hiroaki, 3,944,292.

Summers, James E.: *See*—
Reehil, Edward G.; Summers, James E.; and Modi, Bhogilal M., 3,944,794.

Sumpter, Willie J. Internal combustion engine with clutch transmission. 3,943,894, Cl. 123-54.00R.

Sun Chemical Corporation: *See*—
Adams, William R., 3,944,509.

Sunderland, Willis W., to United States of America, Army. Embossing method. 3,943,741, Cl. 72-57.000.

Sundquist, Arvid M. Casket lock structure. 3,944,267, Cl. 292-158.000.

Sundstrand Data Control, Inc.: *See*—
Bateman, Charles D.; and Muller, Hans Rudolf, 3,944,968.

Supper, Ottmar, to Daimler-Benz Aktiengesellschaft. Mechanism for the actuation of an adjusting member. 3,943,784, Cl. 74-110.000.

Surkov, Igor Konstantinovich: *See*—
Broide, Pinkhus Ruvimovich; Surkov, Igor Konstantinovich; and Grachev, Andrei Nikolaevich, 3,943,664.

Suto, Munehisa; Itoh, Takuji; Tagaya, Nobuaki; and Obayashi, Takashi, to Exxon Research & Engineering Co. Catalyst for conversion of heavy hydrocarbon oils. 3,944,503, Cl. 252-455.00R.

Sutton, Blaine M.; Walz, Donald T.; and Wilson, James W., to Smith-Kline Corporation. Ester derivatives of pulvinic acid. 3,944,571, Cl. 260-343.600.

Sutton, Walter T., Jr.; and Sims, James B., to Texas Instruments Incorporated. Degaussing circuit for color television receivers. 3,944,870, Cl. 315-8.000.

Suwama, Toshitaka; and Murakoshi, Makoto, to Fuji Photo Film Co., Ltd. Optical information recording device. 3,945,018, Cl. 346-44.000.

Suzuki, Masao, to Sony Corporation. Pin cushion distortion correction circuit. 3,944,879, Cl. 315-370.000.

Suzuki, Michiko, to Canon Kabushiki Kaisha. Optical system for a color television camera. 3,945,034, Cl. 358-50.000.

Suzuki, Munenobu: *See*—
Umino, Tomio; Suzuki, Munenobu; and Shida, Tomohiko, 3,944,779.

Suzuki, Takeo: *See*—
Tsunoda, Ichiro; Takeuchi, Satoshi; Hirao, Yoichiro; Suzuki, Takeo; Nishiue, Yoshihiro; Tadokoro, Katsumasa; Fukagawa, Toshimasa; Harada, Isamu; Misawa, Akira; and Watanabe, Kazuo, 3,944,330.

Suzuki, Yasoji; and Manabe, Kenshi, to Tokyo Shibaura Electric Co., Ltd. Series logic circuit arrangement using a plurality of complementary IGFET's. 3,945,000, Cl. 340-336.000.

Suzuki, Yasuo, to Nissin Electric Co., Ltd. Crowbar switch. 3,944,887, Cl. 317-16.000.

Suzuki, Yoshiaki; Mori, Hajime; and Nakanome, Takemi, to Mitsubishi Chemical Industries, Ltd. Method for the separation of hydrocarbons. 3,944,628, Cl. 260-674.00N.

Svirklys, Ferdinand M., to Dominion Al-Chrome Corporation. Etch timing device. 3,943,880, Cl. 116-114.00R.

Svoboda, Josef: *See*—
Weigl, Erwin; and Svoboda, Josef, 3,944,238.

Swallow, Ronald J., to Research Corporation. Image generator for a multiterminal graphic display system. 3,944,997, Cl. 340-324.0AD.

Swan, Andrew: *See*—
Coleman, Arthur; Swan, Andrew; and Doig, David, 3,944,762.

Swanson, Donald A.: *See*—
Bell, Duncan; Swanson, Donald A.; and Veale, John P., 3,944,120.

Sweco, Inc.: *See*—
McKibben, Richard K., 3,943,668.

Swenson, Starkie L., to Unisource Corporation. Pressure sensitive materials and methods of making same. 3,944,692, Cl. 428-40.000.

Swift, Harold E.: *See*—
Mitchell, Bruce R.; and Swift, Harold E., 3,944,482.

Swingline, Inc.: *See*—
Young, Raymond R.; and Michaelis, Jack H., 3,944,374.

Swiss Aluminium Limited: *See*—
Pryor, Michael J.; Ford, James A.; and Dean, Sheldon W., 3,944,439.

Sword, Geoffrey; Lawrence, John Leslie; Raggett, Stephen Richard; and Blakemore, Bernard, to Colourvision Associates. Electro-optical systems. 3,944,739, Cl. 178-7.850.

Sybron Corporation: *See*—
Schreckendgust, Jay G., 3,944,387.

Symchowicz, Samson; and Faro, Hans-Peter, to Schering Corporation. Substituted aryl and aralkyl amides in the treatment of parkinsonism. 3,944,675, Cl. 424-324.000.

Syrenne, Marius H., to National Sanitation Services, Ltd. Chemical dispenser. 3,943,960, Cl. 137-268.000.

T - L Irrigation Company: *See*—
Thom, Le Roy W.; Eldred, Rodney D.; and Soderquist, Douglas R., 3,944,007.

Tabachnikov, Viktor Iosifovich: *See*—
Derzhavets, Abram Yakovlevich; Kogan, Petr Grigorievich; and Tabachnikov, Viktor Iosifovich, 3,944,489.

Tacke, Maurus; and Ulrich, Reinhard, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Waveguide. 3,944,326, Cl. 350-96.0WG.

Tacke, Michael: *See*—
Dorr, Karl-Heinz; Grimm, Hugo; Sander, Ulrich; Peichl, Robert; and Tacke, Michael, 3,944,401.

Tadokoro, Katsumasa: *See*—
Tsunoda, Ichiro; Takeuchi, Satoshi; Hirao, Yoichiro; Suzuki, Takeo; Nishiue, Yoshihiro; Tadokoro, Katsumasa; Fukagawa, Toshimasa; Harada, Isamu; Misawa, Akira; and Watanabe, Kazuo, 3,944,330.

Tadokoro, Tomoo: *See*—
Matsuoka, Sadao; Takeshita, Takashi; Tadokoro, Tomoo; and Nakao, Masami, 3,943,899.

Tafur, Susan S., to Eli Lilly and Company. 4-Desacetoxy-3-hydroxyvinblastine. 3,944,554, Cl. 260-287.00B.

Tagaya, Nobuaki: *See*—
Suto, Munehisa; Itoh, Takuji; Tagaya, Nobuaki; and Obayashi, Takashi, 3,944,503.

Taguchi, Tetsuya: *See*—
Hasegawa, Goro; Nakamoto, Soichi; Watanabe, Yoshiaki; Taguchi, Tetsuya; and Yamada, Katuhiko, 3,945,024.

Tahara, Yukio: *See*—
Okada, Akira; Izumi, Ryoji; Ninomiya, Syogo; Tahara, Yukio; Takehara, Yuji; Suezawa, Masaaki; and Kawasaki, Kazuhiro, 3,944,144.

Tailler, Louis, to Thomson-CSF. System equipped with an arrangement providing protection against the Corona effect. 3,944,720, Cl. 174-73.00R.

Tajima, Akira; Hirose, Ryusho; Hosoe, Kazuya; Furukawa, Hiroshi; and Ichiyanagi, Toshikazu, to Canon Kabushiki Kaisha. Image stabilized zoom lens system. 3,944,324, Cl. 350-16.000.

Takachiho Koeki Kabushiki Kaisha: *See—*
Yamada, Minoru, 3,944,989.

Takada, Keisuke; Gamo, Ryouji; and Sato, Ikuo, to Tokyo Shibaura Electric co., Ltd. Electromagnetic flow meter. 3,943,765, Cl. 73-194.0EM.

Takahara, Hiroyasu; Morishita, Isao; Shiga, Mikio; and Uchijima, Toshikatsu, to Japan Tobacco & Salt Public Corporation, The; and Fuji Flavor Company, Limited. Process for imparting a coumarin-like aroma and flavor to tobacco, foods and drinks. 3,944,679, Cl. 426-538.000.

Takahashi, Kunihiro; Aya, Norimoto; Osaka, Kenji; and Furuta, Mithuru, to Nissan Motor Company Limited. Automobile door and door pillar assembly preventing detachment of door during collision. 3,944,278, Cl. 296-146.000.

Takahashi, Masayoshi: *See—*
Koyanagi, Haruo; Takahashi, Masayoshi; Yamauchi, Nobuharu; Matsumura, Masaji; and Morimoto, Katsuhide, 3,944,987.

Takahashi, Nobuaki; Kasuga, Masao; and Itoh, Yasuo, to Victor Company of Japan, Ltd. Composite filter circuit. 3,944,755, Cl. 179-100.4ST.

Takahashi, Seiji; and Kaibara, Nobuhiro, to Diesel Kiki Kabushiki Kaisha. Unit injector for a diesel engine. 3,943,901, Cl. 123-139.0AS.

Takahashi, Shigenori, to Sony Corporation. Centering circuits employed for beam deflection circuits. 3,944,882, Cl. 315-398.000.

Takahashi, Yoshio: *See—*
Kitagaki, Tadaharu; Takahashi, Yoshio; and Takita, Kiyoshi, 3,944,664.

Takani, Satoru: *See—*
Akiyama, Takao; Takani, Satoru; and Atsumo, Hideo, 3,943,751.

Takao, Tsutomu, to Nippon Piston Ring Co., Ltd. Piston ring. 3,944,236, Cl. 277-224.000.

Takasago Perfumery Co., Ltd.: *See—*
Otsuki, Hiroshi; Sakuma, Kenzo; and Matsuzawa, Isamu, 3,944,565.

Takehara, Yuji: *See—*
Okada, Akira; Izumi, Ryoji; Ninomiya, Syogo; Tahara, Yukio; Takehara, Yuji; Suezawa, Masaaki; and Kawasaki, Kazuhiro, 3,944,144.

Takemura, Atushi: *See—*
Kawai, Yoshihiro; and Takemura, Atushi, 3,944,765.

Takeshita, Takashi: *See—*
Matsuoka, Sadao; Takeshita, Takashi; Tadokoro, Tomoo; and Nakao, Masami, 3,943,899.

Takeuchi, Satoshi: *See—*
Tsunoda, Ichiro; Takeuchi, Satoshi; Hirao, Yoichiro; Suzuki, Takeo; Nishiue, Yoshihiro; Tadokoro, Katsumasa; Fukagawa, Toshimasa; Harada, Isamu; Misawa, Akira; and Watanabe, Kazuo, 3,944,330.

Takeuchi, Setsuyuki: *See—*
Sato, Wasuke; Iriko, Fumio; Yuzawa, Yoshihiko; Takeuchi, Setsuyuki; and Ibe, Nobukuni, 3,944,643.

Takita, Kiyoshi: *See—*
Kitagaki, Tadaharu; Takahashi, Yoshio; and Takita, Kiyoshi, 3,944,664.

Tamada, Teruo: *See—*
Yanagita, Tadafumi; Tamada, Teruo; and Tanaka, Yuma, 3,944,182.

Tamano, Motokazu; and Yoshioka, Masanobu, to Tokyo Shibaura Electric Co., Ltd. Electronic digital timer for an electronic range. 3,944,790, Cl. 235-92.00T.

Tammy, Simon Z., to Nordson Corporation. Control system for double acting air motor. 3,943,823, Cl. 91-306.000.

Tanaka, Kazuhide. Submerging system for marine structure. 3,943,871, Cl. 114-66.000.

Tanaka, Yoshiaki: *See—*
Nishiyama, Keizo; Yoshida, Yasushi; Yamazaki, Mutsumi; Iwata, Kohshi; and Tanaka, Yoshiaki, 3,944,514.

Tanaka, Yoshiharu: *See—*
Kobayashi, Takeshi; and Tanaka, Yoshiharu, 3,944,995.

Tanaka, Yuma: *See—*
Yanagita, Tadafumi; Tamada, Teruo; and Tanaka, Yuma, 3,944,182.

Tanihara, Yozo; and Niimi, Masayasu, to Hitachi, Ltd. Color eliminating circuit. 3,945,033, Cl. 358-26.000.

Taniwaki, Genshi, to Kongo Co., Ltd. Manually movable wheeled storage rack or the like. 3,944,309, Cl. 312-198.000.

Tannenbaum, Stanley: *See—*
Marlowe, Bernard; and Tannenbaum, Stanley, 3,944,448.

Tanoshima, Katsuhide: *See—*
Watanabe, Akinori; and Tanoshima, Katsuhide, 3,943,847.

Tantlinger, Keith W., to Rohr Industries, Inc. Tab style cantilever seat mount. 3,944,201, Cl. 296-63.000.

Tapco Products Company, Inc.: *See—*
Marsh, Walter G.; and Rhoades, James J., 3,943,744.

Tasch, Al Felix, Jr.; and Caywood, John Millard, to Texas Instruments Inc. Charge transfer device signal processing. 3,944,849, Cl. 307-221.00D.

Tassin, Claude J.: *See—*
Azalbert, Jean-Paul; Giraud, Adrien; Tassin, Claude J.; and Pech, Christian H., 3,943,721.

Taylor, Lynn J., to Owens-Illinois, Inc. Chemically modified polymers. 3,944,511, Cl. 260-23.00H.

Taylor Servomex Limited: *See—*
Borer, Alan John, 3,944,920.

Teague, Walter Dorwin, Jr., to Morris, James Reed, IV; Morris, Mary Carroll Sinclaire; Morris, Halsted; and Morris, Katrina, part interest to each. Ski binding. 3,944,237, Cl. 280-11.35K.

Tebron Holdings Ltd.: *See—*
Hamy, Norbert, 3,944,044.

Tecnomare S.p.A.: *See—*
Banzoli, Valeriano; De Nora, Giovanni; Di Tella, Vincenzo; Lalli, Domenico; and Tempo, Gianfranco, 3,943,724.

Tedeco AG: *See—*
Zettergren, Ted, 3,943,973.

Tedeschi, Piero: *See—*
Adembri, Giorgio; Tedeschi, Piero; Ponticelli, Fabio; and Marini, Maresco, 3,944,563.

Tel-Pac, Inc.: *See—*
Lewis, Ronald A., 3,943,918.

Telefonaktiebolaget L M Ericsson: *See—*
Pettersson, Georg Gustaf Lennart, 3,944,858.

Telefunken Patentverwertungs-G.m.b.H.: *See—*
Schmucker, Georg, 3,945,008.

Teletype Corporation: *See—*
Heeren, Richard H., 3,944,848.

Teller, Daniel M.; Sellstedt, John H.; and Guinosso, Charles J., to American Home Products Corporation. 7-[2-(Dithiocarboxylamino)alkanamido]-cephalosporanic acid derivatives. 3,944,580, Cl. 260-243.00C.

Temerev, Anatoly Fedorovich: *See—*
Vainer, Shimon Abramovich; Temerev, Anatoly Fedorovich; Vainer, Savely Abramovich; Nikulin, Sergei Sergeevich; Kheifets, Matvei Evseevich; Usoltsev, Vadim Anatolievich; Matveev, Evgeny Fedorovich; Kazakov, Georgy Petrovich; Salkov, Vladimir Alexandrovich; and Malinin, Anatoly Isidorovich, 3,944,441.

Temnikow, Victor: *See—*
Weiss, Sidney; Temnikow, Victor; and Eigen, Edward, 3,944,663.

Temple, Fred: *See—*
Mong, William K.; and Temple, Fred, 3,944,264.

Tempo, Gianfranco: *See—*
Banzoli, Valeriano; De Nora, Giovanni; Di Tella, Vincenzo; Lalli, Domenico; and Tempo, Gianfranco, 3,943,724.

Tendrup, Donald L.: *See—*
DeVito, Joseph; and Tendrup, Donald L., 3,943,661.

Tenneco Inc.: *See—*
Worden, Donald P., 3,944,775.

Terashima, Hisaei: *See—*
Tsuboi, Junichiro; and Terashima, Hisaei, 3,944,776.

Terry, Lynn E.; and Schoeppel, Roger J. Hydride-dehydride power system and methods. 3,943,719, Cl. 60-644.000.

Teshima, Haruto; and Inui, Toshiaki, to Matsushita Electric Industrial Company, Ltd. Automatic music playing system. 3,943,813, Cl. 84-1.030.

Tetra Pak Developpement SA: *See—*
Rausing, Anders Ruben, 3,943,682.

Texaco Inc.: *See—*
Flournoy, Kenoth H.; Cardenas, Ricardo L.; and Carlin, Joseph T., 3,943,954.
Hess, Howard V.; Cole, Edward L.; and Franz, William F., 3,944,462.
Wiley, Morris A.; Schlicht, Raymond C.; and Waldbillig, James O., 3,944,495.

Texas Instruments Incorporated: *See—*
Audette, Richard T.; and Perry, Frederick G., 3,944,960.
Brandstaetter, David Peter; and Harris, James Marian, 3,944,985.
Gale, Pliny M., 3,944,983.
Jenne, Richard L.; Marcoux, Leo; and Evans, Thomas E., 3,944,970.
Jones, James J., 3,944,289.
Jost, Ernest M., 3,944,787.
Kilby, Jack S.; Schweitzer, Robert F.; and McCrady, John, 3,944,724.
Sutton, Walter T., Jr.; and Sims, James B., 3,944,870.
Tasch, Al Felix, Jr.; and Caywood, John Millard, 3,944,849.

Texas Medical Products, Inc.: *See—*
Reed, Charles C.; Sharp, Russell G.; and Cooley, Denton A., 3,944,261.

Theisen, Dieter: *See—*
Beck, Manfred; Fritz, Rainer; and Theisen, Dieter, 3,944,533.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen Industriegesellschaft MBH. Track surfacing. 3,943,857, Cl. 104-7.00R.

Thevenet, Daniel: *See—*
Chagny, Jean; Francoise, Guy; and Thevenet, Daniel, 3,944,824.

Thiel, Max: *See—*
Winter, Werner; Thiel, Max; Stach, Kurt; Roesch, Egon; and Sponer, Gisbert, 3,944,566.

Thiess, Harold C.; and Jahnke, Harold N., to A. Finkl & Sons Company. Method for heat treating cylindrical products. 3,944,444, Cl. 148-12.400.

Thiokol Corporation: *See—*
Davis, Delmar B.; and Christensen, Wendell N., 3,944,487.
Marlowe, Bernard; and Tannenbaum, Stanley, 3,944,448.

Thom, Le Roy W.; Eldred, Rodney D.; and Soderquist, Douglas R., to T - L Irrigation Company. Planetary drive self-propelled irrigation apparatus. 3,944,007, Cl. 180-14.00R.

Thomas & Betts Corporation: *See—*
Farkas, Paul, 3,943,608.
Thomasson, James T.: *See—*
Jensen, Niels P.; Kasdan, Harvey L.; and Thomasson, James T., 3,944,978.
Thompson, Maxwell A.; and Ning, Tak S., to Southern California Edison Company. Subsynchronous relay. 3,944,846, Cl. 307-129.000.
Thompson, Thomas L.: *See—*
Lafitte, C. Wayne; and Thompson, Thomas L., 3,944,004.
Thomson-CSF: *See—*
Bizouard, Alain; and Rannou, Jean, 3,945,016.
Tailler, Louis, 3,944,720.
Thorn Electrical Industries Limited: *See—*
McLintic, William James, 3,944,320.
Vause, Arthur Samuel, 3,944,808.
Thornley, Derek, to Lucas Electrical Company Limited. Solenoid switches. 3,944,955, Cl. 335-61.000.
Thur, Gerry W.; and DeGraff, Peter H., to NCR Corporation. Change dispenser anti-jam device. 3,943,950, Cl. 133-4.00A.
Tibbe, Gunter, to Hans Kolb KG. Storage device for a safety belt. 3,944,164, Cl. 242-107.40A.
Tidd, Charles Edward, Jr.: *See—*
Hacker, Joseph Michael; Kaufman, Stanley; Sabia, Raffaele Antonio; Sauer, Earl Salvator; Tidd, Charles Edward, Jr.; and Walker, Raymond, 3,944,717.
Tierney, David P. Golf game. 3,944,232, Cl. 273-176.0FB.
Tilg, Robert: *See—*
Maier, Elmar; and Tilg, Robert, 3,944,068.
Tillander, Thomas. Moisture indicating plant receptacle. 3,944,916, Cl. 324-65.00P.
Tillman, Harry Lucian: *See—*
Nonomaque, Clyde Joseph; Tillman, Harry Lucian; and Hortin, Kenneth L., 3,944,111.
Tillmanns, Josef, to Lindemann Maschinenfabrik GmbH. Securing means of replaceable wearing plates in smashing machines. 3,944,091, Cl. 241-285.00A.
Timex Corporation: *See—*
Leibowitz, Marshall, 3,944,333.
Poix, Claude Louis, 3,943,701.
Timfoldgyar, Almasfuzitoi: *See—*
Solymar, Karoly; Zambo, Janos; Orban nee Kelemen, Marika; Bujdoso, Erno; Feher, Ivan; Ozvald, Zoltan; Voros, Istvan; Ferenczi, Tibor; Toth, Pal; Lazar, Ferenc; Pinter, Tihamer; Sigmond, Gyorgy; Siklosi, Peter; Wentzely, Kalman; Lengyel, Laszlo; and Matyasi, Jozsef, 3,944,648.
Timron, Inc.: *See—*
Kessler, Theodore P., 3,944,157.
Titus, Charles H.: *See—*
Jewell, James G.; Kelley, Fred W., Jr.; and Titus, Charles H., 3,944,919.
Tnoue, Mutsuhiro; and Konishi, Ryoichi, to United States of America, Army. Copying device. 3,944,361, Cl. 355-27.000.
Tohyama, Shunroku; Jinda, Takuma; Saito, Shigemitsu; Tsuda, Yoshizo; and Shinohara, Satoshi, to Toray Industries, Inc. Aromatic polyhydrazide fiber of high modulus and high tenacity. 3,944,522, Cl. 260-47.0CP.
Tokai Rika Denki Seisakusho K.K.: *See—*
Noba, Motoi; and Yoshida, Hatsuyoshi, 3,944,774.
Tokico Ltd.: *See—*
Haraikawa, Tetsuo, 3,944,028.
Sugiura, Susumu, 3,943,830.
Toko, Inc.: *See—*
Yanagita, Tadafumi; Tamada, Teruo; and Tanaka, Yuma, 3,944,182.
Tokyo Electric Power Company, Ltd.: *See—*
Ishida, Yotsuo; Okazaki, Takeo; Matsumura, Hajime; Menju, Shinichi; and Ohshima, Iwao, 3,944,886.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Arii, Mitsuru; Kashiwaya, Hideo; and Uchida, Kuniharu, 3,943,755.
Harada, Nozomu, 3,944,816.
Harao, Norio; Obata, Yoshiharu; and Yamaguchi, Tatsuo, 3,944,880.
Ishida, Yotsuo; Okazaki, Takeo; Matsumura, Hajime; Menju, Shinichi; and Ohshima, Iwao, 3,944,886.
Suzuki, Yasoji; and Manabe, Kenshi, 3,945,000.
Takada, Keisuke; Gamo, Ryouji; and Sato, Ikuo, 3,943,765.
Tamano, Motokazu; and Yoshioka, Masanobu, 3,944,790.
Toland, William G.; and Woods, Quentin T., to Chevron Research Company. Artificial turf preparation. 3,944,452, Cl. 156-72.000.
Tolbert, William H.: *See—*
Pipkin, Edward L.; and Tolbert, William H., 3,943,874.
Tomachevsky, Erik: *See—*
Aubert, Gilles; Lemoine, Roger; Maury, Andre; Moulin, Maurice; and Tomachevsky, Erik, 3,943,756.
Tomita, Fujihiko, to Yamaha Hatsudoki Kabushiki Kaisha. Suspension device for vehicles. 3,944,005, Cl. 180-5.00R.
Topfl, Rosemarie: *See—*
Hostettler, Hans; Abel, Heinz; and Topfl, Rosemarie, 3,944,385.
Toray Industries, Inc.: *See—*
Tohyama, Shunroku; Jinda, Takuma; Saito, Shigemitsu; Tsuda, Yoshizo; and Shinohara, Satoshi, 3,944,522.
Torgersen, Daniel L.: *See—*
Bond, Herbert M.; and Torgersen, Daniel L., 3,944,637.
Tornblom, Bengt Hj., to Allmanna Svenska Elektriska Aktiebolaget. Apparatus for magnetically detecting faults in metal bodies utilizing a multiphase generator to generate a rotating field in the body. 3,944,911, Cl. 324-37.000.
Toshiba Kikai Kabushiki Kaisha: *See—*
Nagashima, Kazuo, 3,943,665.
Tote Bulk Handling, Inc.: *See—*
Kuehn, Jack W., 3,944,075.
Toth, Pal: *See—*
Solymar, Karoly; Zambo, Janos; Orban nee Kelemen, Marika; Bujdoso, Erno; Feher, Ivan; Ozvald, Zoltan; Voros, Istvan; Ferenczi, Tibor; Toth, Pal; Lazar, Ferenc; Pinter, Tihamer; Sigmond, Gyorgy; Siklosi, Peter; Wentzely, Kalman; Lengyel, Laszlo; and Matyasi, Jozsef, 3,944,648.
Touchette, Albert F.: *See—*
Hakanson, Nils L.; and Touchette, Albert F., 3,944,367.
Touzet, Georges: *See—*
Leonard, Jean; and Touzet, Georges, 3,943,863.
Towner Manufacturing Company: *See—*
Warner, William; and Gordon, Dale, 3,944,001.
Townsend, Robert H.: *See—*
Snelling, Christopher; Little, William S.; and Townsend, Robert H., 3,944,353.
Toyo Kogyo Co., Ltd.: *See—*
Hirose, Yutaka; and Isomura, Sadao, 3,943,906.
Matsuoka, Sadao; Takeshita, Takashi; Tadokoro, Tomoo; and Nakao, Masami, 3,943,899.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Kosaka, Yujiro; Kuroki, Hitoshi; and Kawasaki, Masakuni, 3,944,695.
Toyota Jidosha Hanbai Kabushiki Kaisha: *See—*
Kato, Takayuki; and Yamazaki, Satoshi, 3,943,759.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Arai, Hiroshi; Watanabe, Yohei; Ohta, Jun; Higo, Nobumasa; and Sakurai, Yasuhiko, 3,944,969.
Noba, Motoi; and Yoshida, Hatsuyoshi, 3,944,774.
Sakai, Toshimitsu; and Saito, Tadashi, 3,943,799.
Tsubaki, Yousuke; and Nakakubo, Tamio, 3,943,893.
Travis, Benjamin H.: *See—*
Rubin, Albert; and Travis, Benjamin H., 3,943,969.
Treichler, Ernest, to Parker-Hannifin Corporation. Combination lock and relief valve for hydraulic systems. 3,943,968, Cl. 137-493.000.
Trenam, Richard S., to United States of America, Navy. Self-optimizing RF signal detection and panoramic display apparatus. 3,944,871, Cl. 315-30.000.
Trepanier, Norman W.: *See—*
Whalen, Mark E.; Trepanier, Norman W.; Kraus, Robert A.; and Malleck, Joseph W., 3,943,617.
Treuner, Uwe: *See—*
Breuer, Hermann; and Treuner, Uwe, 3,944,546.
Trigon, Roland, to CSF - Compagnie Generale de Telegraphie Sans Fil. Antennae with linear aperture. 3,945,009, Cl. 343-7.700.
Trill, Sidney W. Thermoplastic resin pellet ratio loader. 3,944,118, Cl. 222-134.000.
Trkla, Theodore. Dual purpose barbecue grill and rotisserie. 3,943,837, Cl. 99-339.000.
Troll, John H. Wind power conversion system. 3,944,840, Cl. 290-55.000.
Tronsberg, Walter: *See—*
Erfurt, Horst-Lothar; Kreft, Holger; and Tronsberg, Walter, 3,943,867.
Trudell, Erwin R. Cleaning device. 3,944,429, Cl. 134-99.000.
TRW Inc.: *See—*
Hayden, Rodney, 3,944,893.
O'Rell, Michael K., 3,944,553.
Wallace, John Bernard; and Ballard, Frederick William, 3,944,107.
Tsoubanos, Christos, to United States of America, Army. Stabilized terrain optical position sensor. 3,944,729, Cl. 178-6.800.
Tsubaki, Yousuke; and Nakakubo, Tamio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fluid coupling for an internal combustion engine. 3,943,893, Cl. 123-41.120.
Tsuboi, Junichiro; and Terashima, Hisaei. Method of submerged arc welding of high tension steel workpieces. 3,944,776, Cl. 219-73.000.
Tsuda, Akira, to Sony Corporation. Switching circuit for use with balanced transformerless amplifier. 3,944,941, Cl. 330-51.000.
Tsuda, Shin; and Hiraga, Ryozo, to Canon Kabushiki Kaisha. Logic level test probe with grated oscillator. 3,944,921, Cl. 324-133.000.
Tsuda, Yoshizo: *See—*
Tohyama, Shunroku; Jinda, Takuma; Saito, Shigemitsu; Tsuda, Yoshizo; and Shinohara, Satoshi, 3,944,522.
Tsukahara, Masaharu: *See—*
Ohtani, Tadoa; Kato, Nobuyuki; Kojima, Shigeru; Sakamoto, Yoichi; Tsukahara, Masaharu; Kojima, Kiyoshi; Konno, Isago; and Kubo, Takao, 3,944,445.
Tsukamoto, Kenkichi. High-fidelity moving-coil loudspeaker. 3,944,757, Cl. 179-115.50H.
Tsunoda, Ichiro; Takeuchi, Satoshi; Hirao, Yoichiro; Suzuki, Takeo; Nishiue, Yoshihiro; Tadokoro, Katsumasa; Fukagawa, Toshimasa; Harada, Isamu; Misawa, Akira; and Watanabe, Kazuo, to Dainippon Printing Co., Ltd. Electro-optic device. 3,944,330, Cl. 350-160.0LC.
Tsygankin, Nikolai Ivanovich: *See—*
Grishaev, Gennady Ivanovich; and Tsygankin, Nikolai Ivanovich, 3,944,048.
Tubeco, Inc.: *See—*
Wesler, Allan B.; and Katz, Lyber, 3,943,747.

Tuff Manufacturing Co., Inc.: *See—*
Stampone, Peter A., 3,944,296.
Tull, Roger J.; Czaja, Robert F.; Shuman, Richard F.; and Pines, Seemon H., to Merck & Co., Inc. Indenylidene-3-acetic acid process for preparing indene acetic acids. 3,944,600, Cl. 260-515.00A.
Turnbough, Harold L.: *See—*
Schuette, Thomas J.; and Turnbough, Harold L., 3,944,057.
Tutihasi, Simpei; and Nelson, Kyler F., to Xerox Corporation. Optical sensitization and development of liquid crystalline devices. 3,944,332, Cl. 350-160.0LC.
Tuttle, Fordyce E. Signal recognition apparatus. 3,944,733, Cl. 178-7.800.
Uarco Incorporated: *See—*
Bower, Kenneth W., 3,944,206.
Uchida, Kuniharu: *See—*
Arii, Mitsuru; Kashiwaya, Hideo; and Uchida, Kuniharu, 3,943,755.
Uchijima, Toshikatsu: *See—*
Takahara, Hiroyasu; Morishita, Isao; Shiga, Mikio; and Uchijima, Toshikatsu, 3,944,679.
Ueda, Yasuo: *See—*
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,944,422.
Ueno, Hiroshi; Grenfell, James W.; Sorenson, Fred M.; and Hozumi, Kazuo, to Kabushiki Kaisha Morita Seisakusho. Training machine for intra-oral instrumentation. 3,943,629, Cl. 32-71.000.
Ueno, Hiroshi: *See—*
Grenfell, James W.; Sorenson, Fred M.; Ueno, Hiroshi; and Miyahara, Masato, 3,943,914.
Ueno, Masaaki; and Ono, Takehiro, to Kabushiki Kaisha Seikosha. Apparatus and method for recording characters so as to enable reading thereof in a feed direction of a recording sheet therefor. 3,945,019, Cl. 346-74.0ES.
Uhlig, Albert R., to Owens-Illinois, Inc. Method for blow molding plastic articles. 3,944,642, Cl. 264-89.000.
Ulrich, Reinhard: *See—*
Tacke, Maurus; and Ulrich, Reinhard, 3,944,326.
Umeda, Daihachiro. Drying appliance for preventing athlete's foot. 3,943,922, Cl. 128-81.00R.
Umino, Tomio; Suzuki, Munenobu; and Shida, Tomohiko, to Hitachi, Ltd. Process for fusion-welding iron-nickle-cobalt alloy and copper or said alloy, copper and iron. 3,944,779, Cl. 219-121.0EM.
Ungerer, Aaron J., to Standard Products Company, The. Flocked weatherstrip. 3,944,693, Cl. 428-89.000.
Union Carbide Canada Limited: *See—*
Ross, John William, 3,943,722.
Union Carbide Corporation: *See—*
Harding, James, 3,944,703.
Kaplan, Leonard, 3,944,588.
Kordesch, Karl V., 3,944,435.
Lee, Tien Shuey, 3,944,430.
Marsden, James Glenn; and Orenski, Peter Joseph, 3,944,574.
Martin, Jay Robert, 3,944,646.
Union Des Cooperatives Forestieres D'Aquitaine (U.C.F.A.): *See—*
Leonard, Jean; and Touzet, Georges, 3,943,863.
Uniroyal, Inc.: *See—*
Loveless, Frederick C., 3,944,528.
Wheeler, Edward L., 3,944,492.
Unisource Corporation: *See—*
Swenson, Starkie L., 3,944,692.
United States Gypsum Company: *See—*
Balinski, Henry A., 3,943,680.
Dierks, Robert P.; and Rillie, Robert J., 3,944,698.
United States of America
Agriculture: *See—*
Cutchins, Malcolm A.; Foster, Winfred A., Jr.; Orlin, Peter A.; Martin, Fred W.; and Burkhalter, John E., 3,944,137.
Luddy, Francis E.; Hampson, James W.; Herb, Samuel F.; and Rothbart, Herbert L., 3,944,585.
Randall, John M.; Hautala, Earl; Waiss, Anthony C., Jr.; and Kuhnle, Judith A., 3,944,415.
Saunders, Robert M.; and Kohler, George O., 3,944,537.
Air Force: *See—*
Hedberg, Frederick L.; and Arnold, Fred E., 3,944,614.
Villaescusa, Frank W.; Breland, John G.; and Arnold, Fred E., 3,944,575.
Army: *See—*
Bhaskar, Surindar N.; Selting, Wayne J.; Gilmore, Eleanor L.; and Gross, Arthur, 3,943,592.
Dunn, Ralph L., 3,945,005.
Jacobs, Harold; and Chrepta, Metro M., 3,944,950.
Redman, Charles M.; and Moore, Ronald W., 3,944,948.
Reindl, Adolf, 3,944,927.
Schmidlin, Albertus E., 3,943,776.
Sunderland, Willis W., 3,943,741.
Tnoue, Mutsuhiro; and Konishi, Ryoichi, 3,944,361.
Tsoubanos, Christos, 3,944,729.
Woodward, Kenneth E., 3,943,855.
Energy Research and Development: *See—*
Beatty, Ronald L., 3,944,638.
General Counsel-Code GP: *See—*
Garner, Howell D., 3,943,763.
Navy: *See—*
Acks, Robert S.; Watson, Stanley J.; and McCracken, Howard B., 3,944,967.
Caporin, Edward A.; Abruzzo, Joseph; and Rees, Frank L., 3,944,965.
Cleeton, Claud E., 3,945,006.
Gould, Robert A., 3,944,117.
Hering, Frederic S.; and Schwartz, Joseph I., 3,943,873.
Loeser, Harrison T.; and Caldwell, Hamlin A., Jr., 3,944,964.
Panella, Edward A., 3,943,708.
Paslay, LeRoy C., 3,943,870.
Pipkin, Edward L.; and Tolbert, William H., 3,943,874.
Reinker, Ralph W., 3,943,714.
Rubega, Robert A., 3,944,966.
Stotts, Larry B., 3,944,820.
Trenam, Richard S., 3,944,871.
Wolf, Alfred A.; and Halpern, Ernest H., 3,944,578.
U. S. Environmental Protection Agency: *See—*
Dzubay, Thomas G., 3,944,822.
U.S. Philips Corporation: *See—*
Angel, Yves; and Mai Van Duc, Duc, 3,944,912.
Asselman, George Albert Apolonia; Dirne, Adrianus Petrus; and Vromans, Petrus Helena Gerardus Maria, 3,943,964.
Fanshawe, David Geoffrey James, 3,944,994.
Janssen, Peter Johannes Michiel; and Aarts, Petrus Josef Maria, 3,944,901.
Krumme, Jens-Peter; and Hill, Bernhard, 3,944,992.
Penning, Cornelis, 3,944,759.
Postma, Willem Johannes, 3,944,958.
Rabuffetti, Sergio, 3,944,767.
Wank, Larry, 3,943,624.
United States Steel Corporation: *See—*
Nickelsen, Hubert O.; Kopanda, Joseph E.; and Piasecki, Felix J., 3,944,426.
United Turbine AB and Co., Kommanditbolag: *See—*
Kronogard, Sven Olof, 3,943,703.
United Wiring and Manufacturing Co.: *See—*
Rubey, Ulyss Ray, 3,944,719.
Universal Maschinenfabrik: *See—*
Krause, Erich, 3,943,730.
Upjohn Company, The: *See—*
Martin, David G.; and Hanka, Ladislav J., 3,944,562.
Nelson, Norman A., 3,944,593.
Nelson, Norman A., 3,944,595.
Urade, Toshinori: *See—*
Owaki, Kenichi; Urade, Toshinori; and Hirose, Tadatsugu, 3,944,875.
Urbanic, John M.; and Major, Burney A., to Aluminum Company of America. Welding method. 3,944,781, Cl. 219-137.00R.
Usami, Noboru; Sodeyama, Chuichi; and Shoyama, Hirozi, to Hitachi, Ltd. Multi-channel frequency converter having automatic control. 3,944,931, Cl. 325-423.000.
USM Corporation: *See—*
Garner, Derek H.; and Quarmby, Robert C., 3,943,885.
Meyer, Engelbert A., 3,943,610.
Usoltsev, Vadim Anatolievich: *See—*
Vainer, Shimon Abramovich; Temerev, Anatoly Fedorovich; Vainer, Savely Abramovich; Nikulin, Sergei Sergeevich; Kheifets, Matvei Evseevich; Usoltsev, Vadim Anatolievich; Matveev, Evgeny Fedorovich; Kazakov, Georgy Petrovich; Salkov, Vladimir Alexandrovich; and Malinin, Anatoly Isidorovich, 3,944,441.
UTP Arbeitsschutz AG: *See—*
Budmiger, Hermann, 3,943,573.
Vadas, Leslie. Surgical instrument for conization of the cervix. 3,943,916, Cl. 128-2.00B.
Vadnais, David Louis: *See—*
Schierding, Royce Gene; Young, John Russell, Jr.; and Vadnais, David Louis, 3,944,393.
Vainer, Savely Abramovich: *See—*
Vainer, Shimon Abramovich; Temerev, Anatoly Fedorovich; Vainer, Savely Abramovich; Nikulin, Sergei Sergeevich; Kheifets, Matvei Evseevich; Usoltsev, Vadim Anatolievich; Matveev, Evgeny Fedorovich; Kazakov, Georgy Petrovich; Salkov, Vladimir Alexandrovich; and Malinin, Anatoly Isidorovich, 3,944,441.
Vainer, Shimon Abramovich; Temerev, Anatoly Fedorovich; Vainer, Savely Abramovich; Nikulin, Sergei Sergeevich; Kheifets, Matvei Evseevich; Usoltsev, Vadim Anatolievich; Matveev, Evgeny Fedorovich; Kazakov, Georgy Petrovich; Salkov, Vladimir Alexandrovich; and Malinin, Anatoly Isidorovich. Method of making parts from sheet metal by means of oxygen cutting and an arrangement for orientating the gas cutting machine torch in working by said method. 3,944,441, Cl. 148-9.00R.
Valentine, James R.: *See—*
Field, Edwin L.; Lamantia, Charles R.; Lunt, Richard R.; Oberholtzer, James E.; and Valentine, James R., 3,944,649.
Vallalat, Aluterv Aluminiumipari Tervezo: *See—*
Solymar, Karoly; Zambo, Janos; Orban nee Kelemen, Marika; Bujdoso, Erno; Feher, Ivan; Ozvald, Zoltan; Voros, Istvan; Ferenczi, Tibor; Toth, Pal; Lazar, Ferenc; Pinter, Tihamer; Sigmond, Gyorgy; Siklosi, Peter; Wentzely, Kalman; Lengyel, Laszlo; and Matyasi, Jozsef, 3,944,648.
Van Allyn, Inc.: *See—*
Le Van, Wayne P., 3,944,855.
Van Buskirk, Warren T., to Xerox Corporation. Document feeding apparatus and latching mechanism. 3,944,365, Cl. 355-75.000.

van Calsteren, Francois Adriaan; and Hiestand, Willem Pieter, to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzook ten behoeve van de Volksgezondheid. Down-flow chamber. 3,944,405, Cl. 55-338.000.

Van Cappellen, Jan Baptist; and Rens, Walter Johannes, to AGFA-Gevaert. Process for producing polymeric film. 3,944,644, Cl. 264-146.000.

Vandenborre, Jan-Baptist Hugo: *See*—
Spaepen, Gustaaf Frans Josef; and Vandenborre, Jan-Baptist Hugo, 3,944,473.

van den Broek, Albertus Joannes; and de Visser, Jacob, to Akzona Incorporated. Novel steroids of the oestrane series substituted in 7-position. 3,944,576, Cl. 260-397.500.

van der Lely, Ary; and Bom, Cornelis Johannes Gerardus. Tines. 3,943,999, Cl. 172-59.000.

van der Lely, Ary; and Bom, Cornelis Johannes Gerardus. Rotary harrows. 3,944,000, Cl. 172-59.000.

van der Lely, Ary: *See*—
van der Lely, Cornelis; and van der Lely, Ary, 3,944,002.

van der Lely, Cornelis; and van der Lely, Ary. Tine mountings. 3,944,002, Cl. 172-763.000.

Van Horn, George E. Game. 3,944,222, Cl. 273-1.00M.

Van Lue, Dorin F.: *See*—
Petrini, Richard R.; and Van Lue, Dorin F., 3,944,364.

van Pelt, Johannes George; Prins, Albertus; van Roon, Johannes Hendrik; and Smits, Petrus, to Lever Brothers Company. Preparation of whippable emulsions. 3,944,680, Cl. 426-564.000.

van Roon, Johannes Hendrik: *See*—
van Pelt, Johannes George; Prins, Albertus; van Roon, Johannes Hendrik; and Smits, Petrus, 3,944,680.

Van Scoy, Davis A., to Emerson Electric Co. Unidirectional meter prover sphere interchange and method. 3,943,749, Cl. 73-3.000.

van Zeggern, Wilhelm Aart, to Mars, Inc. Energy dissipating device for coin handling mechanisms. 3,944,038, Cl. 194-1.00K.

Vaponics, Inc.: *See*—
Smith, Verity C.; and Reynolds, Lawrence H., 3,943,616.

Varma, Ravi K.: *See*—
Chao, Sam T.; Cimarusti, Christopher M.; and Varma, Ravi K., 3,944,584.

Varta Batterie Aktiengesellschaft: *See*—
Brinkmann, Jurgen; Rasche, Manfred; and Heissmann, Willi, 3,944,432.

Vasilantone, Michael. Squeegee with sweep-movement capability. 3,943,849, Cl. 101-123.000.

Vause, Arthur Samuel, to Thorn Electrical Industries Limited. Lamp mounting assembly. 3,944,808, Cl. 240-52.00R.

Vaz Martins, Filinto. Impedance responsive touch actuated circuit. 3,944,843, Cl. 307-116.000.

Veale, John P.: *See*—
Bell, Duncan; Swanson, Donald A.; and Veale, John P., 3,944,120.

VEB Chemieanlagenbau-und Montagekombinat: *See*—
Jagusch, Leonhard; Schonherr, Werner; and Weiske, Dieter, 3,944,406.

Veb Pentacon Dresden: *See*—
Hahn, Werner; Schulze, Heinz; and Walther, Bernhard, 3,944,154.

Veeder Industries, Inc.: *See*—
Coleman, Arthur; Swan, Andrew; and Doig, David, 3,944,762.

Velcro S.A.: *See*—
De Brabander, Jean Leon Philemon Isidor Pierre, 3,943,981.

Velsicol Chemical Corporation: *See*—
Krenzer, John, 3,944,409.
Krenzer, John, 3,944,410.

Vent-Cair, Inc.: *See*—
Kuechler, Irvin R., 3,943,836.

Vepa AG: *See*—
Fleissner, Heinz, 3,943,734.

Verdol S.A.: *See*—
Frappe, Pierre, 3,944,134.

Verlaeten, Jean, to Solvay & Cie. Electrolytic manufacture of chlorine and sodium carbonate. 3,944,474, Cl. 204-87.000.

Vermont Marble Company: *See*—
Bartenstein, Michael F., 3,943,740.

Verolme Verenigde Scheepswerven B.V.: *See*—
de Does, Joan Charles, 3,943,872.

Verona, Franco, to Aurora S.p.A. Device for fastening the cap of a fountain pen upon the rear portion of the body or barrel of the pen. 3,944,372, Cl. 401-244.000.

VerSchage, Gerald C.: *See*—
Deetz, David R.; Fisk, Bernard C.; VerSchage, Gerald C.; and Donohue, James M., 3,944,360.
Fisk, Bernard C.; VerSchage, Gerald C.; and Donohue, James M., 3,944,359.

Vetco Offshore Industries, Inc.: *See*—
Ahlstone, Arthur G., 3,944,273.

Vetten, Wilhelm, to Jagenberg Werke Aktiengesellschaft. Apparatus for folding and flat-sealing the bottom of a liquid-proof package. 3,943,834, Cl. 93-44.1GT.

Vickers Limited: *See*—
Hicks, Raymond John, 3,943,787.

Victor Company of Japan, Ltd.: *See*—
Ishigaki, Yukinobu, 3,944,754.
Takahashi, Nobuaki; Kasuga, Masao; and Itoh, Yasuo, 3,944,755.

Victor Comptometer Corporation: *See*—
Wilczewski, Robert Hugh; and Schaefer, Rudolf Karl, 3,944,155.

Vieglins, Dzintars Illmars: *See*—
Lundin, Lars Erik; and Vieglins, Dzintars Illmars, 3,943,595.

Viesturs, Eric A. Self-supporting transparent jacket for data sheets or the like. 3,943,645, Cl. 40-10.00D.

Vigo, Francesco M.: *See*—
Foley, Kevin M.; and Vigo, Francesco M., 3,944,707.

Villaescusa, Frank W.; Breland, John G.; and Arnold, Fred E., to United States of America, Air Force. Aryl ether compounds and their synthesis. 3,944,575, Cl. 260-395.000.

Vincent, Gerald. Wheel safety lock. 3,944,285, Cl. 301-9.0DN.

VioBin Corporation: *See*—
Levin, Ezra; and Mosser, John Darwin, 3,944,655.

Visomat-Gerate GmbH: *See*—
Bechtel, Klaus, 3,944,818.

Vits, Hilmar, to Vits-Maschinenbau. Air nozzle for drying a fabric web supported on supporting means. 3,943,639, Cl. 34-155.000.

Vits-Maschinenbau: *See*—
Vits, Hilmar, 3,943,639.

Vockenhuber, Karl: *See*—
Freudenschuss, Otto, 3,944,348.

Vola, Mathias J. J. M.; Koeleman, Gerardus A. J.; and Peeters, Franciscus M. J., to Oce-van der Grinten N.V. Developing apparatus for electrostatic charge images. 3,943,886, Cl. 118-637.000.

Volk, William, to Hydrocarbon Research, Inc. Direct reduction of metallic oxides. 3,944,413, Cl. 75-35.000.

Voll, Samuel T. Toe nail clipper for dogs and other animals. 3,943,947, Cl. 132-73.000.

von der Crone, Jost: *See*—
Model, Ernst; von der Crone, Jost; and Pugin, Andre, 3,944,547.

Voros, Istvan: *See*—
Solymar, Karoly; Zambo, Janos; Orban nee Kelemen, Marika; Bujdoso, Erno; Feher, Ivan; Ozvald, Zoltan; Voros, Istvan; Ferenczi, Tibor; Toth, Pal; Lazar, Ferenc; Pinter, Tihamer; Sigmond, Gyorgy; Siklosi, Peter; Wentzely, Kalman; Lengyel, Laszlo; and Matyasi, Jozsef, 3,944,648.

Vosburgh, Kirby G., to General Electric Company. High energy radiation detector having improved reflective backing for phosphor layer. 3,944,835, Cl. 250-487.000.

Vromans, Petrus Helena Gerardus Maria: *See*—
Asselman, George Albert Apolonia; Dirne, Adrianus Petrus; and Vromans, Petrus Helena Gerardus Maria, 3,943,964.

Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi: *See*—
Kopal, Jaroslav; Jansa, Milos; and Deiss, Jaroslav, 3,943,732.

W. F. Altenpohl, Inc. (Entire): *See*—
Altenpohl, William F., 3,944,078.

W. Schlafhorst & Co.: *See*—
Niederer, Kurt W., 3,943,731.

WABCO Westinghouse GmbH: *See*—
Lindemann, ; Weise, Lutz; and Luhdorff, Dieter, 3,944,291.

Wachi, Masatada: *See*—
Nagai, Yohei; and Wachi, Masatada, 3,943,812.

Wacker Chemie GmbH: *See*—
Barth, Hans-Jochen; Reinecke, Herbert; Hollenbach, Georg; and Kurz, Eduard, 3,944,508.

Wacks, Harvey H., to Energy Conversion Devices, Inc. Microfilm making apparatus. 3,944,357, Cl. 355-5.000.

Waczek, Otto: *See*—
Sollak, Johann; and Waczek, Otto, 3,943,882.

Wade, George C. Portable electric water cooler suitable for outdoor use. 3,943,727, Cl. 62-395.000.

Wagenseil, Ludwig, to Hydromatic GmbH. Rotary machines. 3,943,828, Cl. 91-499.000.

Wagner, Joseph P., to Robertshaw Controls Company. Pressure sensing means and method for making a pressurized container means and system utilizing the same. 3,944,769, Cl. 200-83.00A.

Wagner, Wayne M.: *See*—
Hiemstra, John R.; and Wagner, Wayne M., 3,944,265.

Wainwright, Paul: *See*—
Bradley, Geoffrey; Hargreaves, Keith; and Wainwright, Paul, 3,944,521.

Waiss, Anthony C., Jr.: *See*—
Randall, John M.; Hautala, Earl; Waiss, Anthony C., Jr.; and Kuhnle, Judith A., 3,944,415.

Waldbillig, James O.: *See*—
Wiley, Morris A.; Schlicht, Raymond C.; and Waldbillig, James O., 3,944,495.

Walden, Robert Henry, to Bell Telephone Laboratories, Incorporated. Charge transfer delay line filters. 3,944,850, Cl. 307-221.00D.

Walker, Grant W., to Dynamics Research and Manufacturing, Inc. Roadway impact attenuator. 3,944,187, Cl. 256-13.100.

Walker, Raymond: *See*—
Hacker, Joseph Michael; Kaufman, Stanley; Sabia, Raffacle Antonio; Sauer, Earl Salvator; Tidd, Charles Edward, Jr.; and Walker, Raymond, 3,944,717.

Wallace, John Bernard; and Ballard, Frederick William, to TRW Inc. Closure fastening means. 3,944,107, Cl. 220-326.000.

Waller, David P.: *See*—
Bloom, Stanley M.; Idelson, Elbert M.; Simon, Myron S.; and Waller, David P., 3,944,569.

Walter, John L., to General Electric Company. Directionally solidified nickel-base eutectic alloys. 3,944,416, Cl. 75-170.000.

Walther, Bernhard: *See*—
Hahn, Werner; Schulze, Heinz; and Walther, Bernhard, 3,944,154.

Walton, Erlen B., to Eaton Corporation. Control arrangement. 3,943,713, Cl. 60-395.000.

Walz, Alfons. Mining dredge having endless bucket conveyor and flexible guide train. 3,943,644, Cl. 37-69.000.

Walz, Donald T.: *See—*
Sutton, Blaine M.; Walz, Donald T.; and Wilson, James W., 3,944,571.

Wank, Larry, to U. S. Philips Corporation. Method of manufacturing a magnetic head. 3,943,624, Cl. 29-603.000.

Wardrop, Brian, to Marconi Company Limited, The. Pulse compression radar. 3,945,010, Cl. 343-17.2PC.

Warner, William; and Gordon, Dale, to Towner Manufacturing Company. Hydraulic folding mechanism for discs and the like. 3,944,001, Cl. 172-311.000.

Warnick, William V.: *See—*
Luckock, Glenn W.; and Warnick, William V., 3,944,689.

Warwick Electronics Inc.: *See—*
Wilocki, Richard L., 3,944,884.

Wassen, Willem J.: *See—*
de Rooij, Abraham H.; Elmendorp, Jan; and Wassen, Willem J., 3,944,542.

Wasson, Burton K.; and Williams, Haydn W. R., to Merck & Co., Inc. 3-Hydroxy-3-(1,2,5-thiadiazolyloxyalkanol)-3,4-dihydro-2H-1,5-benzodioxepin products. 3,944,560, Cl. 260-302.00H.

Watanabe, Akinori; and Tanoshima, Katsuhide, to Oki Electric Industry Co., Ltd. High speed printing apparatus. 3,943,847, Cl. 101-114.000.

Watanabe, Akinori; and Noguchi, Matsusaburo, to Oki Electric Industry Co., Ltd. High speed printing apparatus. 3,943,848, Cl. 101-114.000.

Watanabe, Akinori: *See—*
Saito, Koetsu; Yano, Tsutomu; and Watanabe, Akinori, 3,944,335.
Yano, Tsutomu; and Watanabe, Akinori, 3,944,334.

Watanabe, Kazuo: *See—*
Tsunoda, Ichiro; Takeuchi, Satoshi; Hirao, Yoichiro; Suzuki, Takeo; Nishiue, Yoshihiro; Tadokoro, Katsumasa; Fukagawa, Toshimasa; Harada, Isamu; Misawa, Akira; and Watanabe, Kazuo, 3,944,330.

Watanabe, Mikio: *See—*
Morisaki, Kazuo; and Watanabe, Mikio, 3,944,687.

Watanabe, Satoshi; and Sato, Koji, to Kabushiki Kaisha Saginomiya Seisakusho. Automatic thermograph. 3,945,017, Cl. 346-33.0TP.

Watanabe, Yohei: *See—*
Arai, Hiroshi; Watanabe, Yohei; Ohta, Jun; Higo, Nobumasa; and Sakurai, Yasuhiko, 3,944,969.

Watanabe, Yoshiaki: *See—*
Hasegawa, Goro; Nakamoto, Soichi; Watanabe, Yoshiaki; Taguchi, Tetsuya; and Yamada, Katuhiko, 3,945,024.

Waters, John R., to Johnston Laboratories, Inc. Method and apparatus for detecting biological activity. 3,944,471, Cl. 195-103.50R.

Waters, Paul F.: *See—*
Hadermann, Albert F.; Waters, Paul F.; and Woo, Jung Woo, 3,944,918.

Watson Industrial Properties: *See—*
Frisz, James O.; and Price, Harold A., 3,944,086.

Watson, Stanley J.: *See—*
Acks, Robert S.; Watson, Stanley J.; and McCracken, Howard B., 3,944,967.

Watson, William Bruce; and Graves, Vernon James, to Consumers Glass Company Limited. Threaded wine bottle stopper. 3,944,104, Cl. 215-307.000.

Wattimena, Freddy: *See—*
Schram, Cornelis W. A.; and Wattimena, Freddy, 3,944,627.

Weaver, Earl W., to P.D.I. Inc. Latch for sliding doors. 3,944,266, Cl. 292-145.000.

Weaver, George R., to Campbell Soup Company. Automatic package selector. 3,944,051, Cl. 198-40.000.

Weber, Karl Heinz: *See—*
Bauer, Adolf; Weber, Karl Heinz; Minck, Klaus; and Danneberg, Peter, 3,944,579.

Wehren, Peter: *See—*
Eichholz, Gunter; and Wehren, Peter, 3,944,145.

Weigl, Erwin; and Svoboda, Josef, to Gertsch AG. Guide plate for ski bindings. 3,944,238, Cl. 280-11.35C.

Weise, Lutz: *See—*
Lindemann, ; Weise, Lutz; and Luhdorff, Dieter, 3,944,291.

Weiske, Dieter: *See—*
Jagusch, Leonhard; Schonherr, Werner; and Weiske, Dieter, 3,944,406.

Weiss, Adolph. Multi-size mailing carton. 3,944,131, Cl. 229-40.000.

Weiss, Francis: *See—*
Bader, Andre; and Weiss, Francis, 3,944,591.

Weiss, Sidney; Temnikow, Victor; and Eigen, Edward, to Colgate Palmolive Company. Mild light duty detergent containing homopolymers of ethylene oxide. 3,944,663, Cl. 424-78.000.

Weit, James G.; and Newcamp, Charles W., to Control Systems Research, Inc. Zero deadband four-quadrant full-wave converter. 3,944,907, Cl. 321-13.000.

Weitzman, Milton J.; and Rosenbaum, Saul, to Leviton Manufacturing Co., Inc. Terminal for establishing a stable electrical connection to aluminum wire. 3,944,314, Cl. 339-95.000.

Welden, Robert P.; and O'Connor, Lawrence V., to Foster Wheeler Energy Corporation. Split stream burner assembly. 3,944,142, Cl. 239-552.000.

Wellman, Donald E., to General Crane Industries Limited. Tower crane. 3,944,081, Cl. 212-46.00B.

Welsh, James W., to Langley Corporation. Electronics cabinet assembly. 3,944,310, Cl. 312-263.000.

Wemekamp, Henry. Electric organ tone generating system. 3,943,814, Cl. 84-1.010.

Wenckus, Joseph F.: *See—*
Haggerty, John S.; Menashi, Wilson P.; and Wenckus, Joseph F., 3,944,640.

Wendel, Kurt: *See—*
Distler, Dieter; Wendel, Kurt; Einwiller, Andreas; and Oppenlaender, Knut, 3,944,690.

Wentzely, Kalman: *See—*
Solymar, Karoly; Zambo, Janos; Orban nee Kelemen, Marika; Bujdoso, Erno; Feher, Ivan; Ozvald, Zoltan; Voros, Istvan; Ferenczi, Tibor; Toth, Pal; Lazar, Ferenc; Pinter, Tihamer; Sigmond, Gyorgy; Siklosi, Peter; Wentzely, Kalman; Lengyel, Laszlo; and Matyasi, Jozsef, 3,944,648.

Werkema, Robert G.: *See—*
Coggins, Dolphus L.; and Werkema, Robert G., 3,944,496.

Werner, Gerhard: *See—*
Broecker, Bernhard; Schardt, Richard; and Werner, Gerhard, 3,944,512.

Wesler, Allan B.; and Katz, Lyber, to Tubeco, Inc. Portable hot pipe bending apparatus. 3,943,747, Cl. 72-388.000.

Western Electric Company: *See—*
Sobanski, Edward Walter, 3,944,750.

Western Electric Co., Inc.: *See—*
Bigatel, Alfred I.; Jarrett, Quentin T.; Petskus, Ronald A.; Rowan, David C.; and Scheetz, Joseph M., 3,944,419.
Hacker, Joseph Michael; Kaufman, Stanley; Sabia, Raffaele Antonio; Sauer, Earl Salvator; Tidd, Charles Edward, Jr.; and Walker, Raymond, 3,944,717.
Hively, Lee Mizener, 3,944,963.

Western Gear Corporation: *See—*
Bell, Duncan; Swanson, Donald A.; and Veale, John P., 3,944,120.

Westinghouse Air Brake Company: *See—*
Cannon, John G., 3,944,298.
Mong, William K.; and Temple, Fred, 3,944,264.
Staples, Crawford E., 3,944,986.

Westinghouse Electric Corporation: *See—*
Davies, Norman, 3,944,772.
DeCorso, Serafino M.; and Pillsbury, Paul W., 3,943,705.
Kim, He B.; and Driver, Michael C., 3,943,622.
Krishna, Surinder; and Chu, Chang Kwei, 3,945,028.
Marchese, Robert T., 3,944,466.

Westley, John, to Hoffman-La Roche Inc. Iso-lasalocid A. 3,944,573, Cl. 260-347.300.

Wetzels, Walter; Greven, Johann; Romer, Wilhelm; and Hoppe, Heinz, to Schumag Schumacher Metallwerke Gesellschaft mit beschrankter Haftung. Method and apparatus for controlling with increased accuracy a processing machine driven at varying operating speeds, such as a slide drawing machine, especially, as well as the slide drawing machine per se and auxiliary device. 3,943,743, Cl. 72-290.000.

Wexler, Paul; and Fischer, Boguslav H. Anal sphincter device and barium enema plug. 3,943,938, Cl. 128-421.000.

Whalen, Mark E.; Trepanier, Norman W.; Kraus, Robert A.; and Malleck, Joseph W., to Republic Steel Corporation. Novel apparatus and solid state method for converting small pieces of metal to a workpiece. 3,943,617, Cl. 29-403.000.

Wheeler, Edward L., to Uniroyal, Inc. Lubricant compositions containing N-substituted naphthylamines as antioxidants. 3,944,492, Cl. 252-50.000.

Whirlpool Corporation: *See—*
Janke, Donald Edward, 3,944,841.
Nonomaque, Clyde Joseph; Tillman, Harry Lucian; and Hortin, Kenneth L., 3,944,111.

White, Lyall B. Gas broiler. 3,943,910, Cl. 126-41.00R.

White-Westinghouse Corporation: *See—*
Frantti, Edsel W.; and Antol, Ronald F., 3,944,807.

Whitehurst, Darrell D.; Butter, Stephen A.; and Rodewald, Paul G., to Mobil Oil Corporation. Sorbent for removal of heavy metals. 3,944,501, Cl. 252-182.000.

Wichers, Max F. Spectacle structure. 3,944,344, Cl. 351-41.000.

Wiechert, Rudolf: *See—*
Laurent, Henry; and Wiechert, Rudolf, 3,944,577.

Wiesmuller, Siegfried: *See—*
Kraus, Helmut; and Wiesmuller, Siegfried, 3,945,021.

Wilbur, Donald A.; and Peters, Philip H., Jr., to General Electric Company. Radio frequency noise generating magnetron. 3,944,872, Cl. 315-39.510.

Wilczewski, Robert Hugh; and Schaefer, Rudolf Karl, to Victor Comptometer Corporation. Ribbon spool. 3,944,155, Cl. 242-74.000.

Wiley, Morris A.; Schlicht, Raymond C.; and Waldbillig, James O., to Texaco Inc. Metal dialkyldithiophosphates. 3,944,495, Cl. 252-75.000.

Wilhelm, John W., Jr., to Skidmore-Wilhelm Mfg. Co. Tablet hardness tester and method of testing. 3,943,757, Cl. 73-78.000.

Wilkinson, William Kenneth, to Du Pont de Nemours, E. I., and Company. Process for dyeing filaments of acrylic polymer. 3,944,386, Cl. 8-177.00R.

Willburger, Nikolaus: *See—*
Brunner, Anton; and Willburger, Nikolaus, 3,945,013.

Willcocks, Martin Edmund George, to Bogue, John C.; and Ruggles, Wesley, Jr. Directional enhancement system for quadraphonic decoders. 3,944,735, Cl. 179-1.0GQ.

Williams, Colin, to Imperial Chemical Industries Limited. Plastic capacitors. 3,944,895, Cl. 317-258.000.

Williams, David Gordon: *See—*
Allport, Maurice James; and Williams, David Gordon, 3,944,905.

Williams, Frank J.: *See—*
Quinn, Clayton B.; and Williams, Frank J., 3,944,517.

Williams, Haydn W. R.: *See*—
Wasson, Burton K.; and Williams, Haydn W. R., 3,944,560.
Williams, Leonard H. Pipe cutter. 3,943,626, Cl. 30-100.000.
Willis, William B. Combined trash and ash receptacle. 3,944,110, Cl. 220-23.830.
Wilocki, Richard L., to Warwick Electronics Inc. Adjustable pincushion correction circuit. 3,944,884, Cl. 315-400.000.
Wilson, James W.: *See*—
Sutton, Blaine M.; Walz, Donald T.; and Wilson, James W., 3,944,571.
Wily, John L., to Rockwell International Corporation. Method and apparatus for producing a knitted fabric interlaced with insert elements. 3,943,733, Cl. 66-125.00R.
Windmoller & Holscher: *See*—
Brockmuller, Friedrich Franz, 3,943,833.
Wing, Milton Silas; and Head, Billy Duane, to Dow Chemical Company, The. Conversion of crude oil fractions to olefins. 3,944,481, Cl. 208-61.000.
Winner Food Products Limited: *See*—
Hai, Harry Wong Hon, 3,943,658.
Winter, August; Mann, Egon; and Meyerle, Michael, to Zahnradfabrik Friedrichshafen AG. Traction-wheel mounting with attached drive motor. 3,944,010, Cl. 180-55.000.
Winter, Werner; Thiel, Max; Stach, Kurt; Roesch, Egon; and Sponer, Gisbert, to Boehringer Mannheim GmbH. Tricyclic substituted aminoalcohols. 3,944,566, Cl. 260-328.000.
Wisdom, Ronald David, to Chrysler United Kingdom Limited. Interior lights for motor vehicles. 3,944,804, Cl. 240-7.250.
Wolf, Alfred A.; and Halpern, Ernest H., to United States of America, Navy. Organic superconductors with high transition temperatures and high critical magnetic fields. 3,944,578, Cl. 260-397.100.
Wolf, Helmut; Bohm, Wolfgang; and Stucker, Erwin, to Kraftwerk Union Aktiengesellschaft. Device for determining surface strains during the measurement of inherent stresses in structural components of machines or apparatus. 3,943,758, Cl. 73-88.50R.
Wolf, Karl, to Du Pont de Nemours, E. I., and Company. Headbox assembly for a papermaking machine. 3,944,465, Cl. 162-336.000.
Wolfe, Marvin: *See*—
McCall, Richard J.; and Wolfe, Marvin, 3,944,129.
Wolski, Francis; and Zaremskas, Alan A., to Schook, Omer H.; and Zaremskas, Alan A., part interest to each. Spring-loaded live center. 3,943,804, Cl. 82-33.00R.
Woo, Jung Woo: *See*—
Hadermann, Albert F.; Waters, Paul F.; and Woo, Jung Woo, 3,944,918.
Woo, Yen Kong. Acupuncture needles and holder. 3,943,932, Cl. 128-303.180.
Wood, Charles G., to Essex International, Inc. Seat belt buckle having pushbutton type switch with elastomeric conductor bridging contact. 3,944,766, Cl. 200-61.58B.
Wood, David Bradford, III: *See*—
Luebkemann, Harry Paul E.; and Wood, David Bradford, III, 3,943,802.
Wooddy, Douglas W., Jr.; and Wooddy, Muna G. Drive belt repair kit. 3,944,065, Cl. 206-223.000.
Wooddy, Muna G.: *See*—
Wooddy, Douglas W., Jr.; and Wooddy, Muna G., 3,944,065.
Woods, Quentin T.: *See*—
Toland, William G.; and Woods, Quentin T., 3,944,452.
Woodward, Kenneth E., to United States of America, Army. Computer for missile. 3,943,855, Cl. 102-70.00R.
Woolf, Homer H.; and Woolf, Lucille M. Toilet tank flush control. 3,943,577, Cl. 4-67.00R.
Woolf, Lucille M.: *See*—
Woolf, Homer H.; and Woolf, Lucille M., 3,943,577.
Worden, Donald P., to Tenneco Inc. Welding process. 3,944,775, Cl. 219-67.000.
Worldwide Converting Machinery, Inc.: *See*—
Lee, Frank X.; Krimsky, Leonard C.; and Freytag, Donald R., 3,944,151.
Worner, Klaus: *See*—
Ehrenberg, Kurt; and Worner, Klaus, 3,943,678.
Wowczyk, Hans J. Apparatus for cutting aligned notches in parallel wooden frame members. 3,943,985, Cl. 144-134.00A.
Wright, Andrew Charles Walden: *See*—
Newstead, Charles; and Wright, Andrew Charles Walden, 3,943,829.
Wright, Maurice James, to Joseph Lucas (Industries) Limited. Control circuits for electrically driven vehicles. 3,944,897, Cl. 318-139.000.
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Wulf, Helmut; and Schiesterl, Gerhard, to Daimler-Benz Aktiengesellschaft. Automatically inflatable gas cushion for the protection of the passengers of vehicles. 3,944,250, Cl. 280-150.0AB.
Wyse, Stanley F., to Litton Systems, Inc. Multigimbal flexure universal joint. 3,943,778, Cl. 74-5.00F.
Wyss, Otto. Grating. 3,943,675, Cl. 52-177.000.
Xerox Corporation: *See*—
Bains, Sudarshan S., 3,944,207.
Bergen, Richard F., 3,944,358.
Deetz, David R.; Fisk, Bernard C.; VerSchage, Gerald C.; and Donohue, James M., 3,944 360.
Donnelly, Thomas L.; and Mullen, Edward J., 3,944,783.
Fisk, Bernard C.; VerSchage, Gerald C.; and Donohue, James M., 3,944,359.
Hayne, Thomas F., 3,944,356.
Hayskar, Robert A., 3,944,121.
Parent, Richard A., 3,944,710.
Parent, Richard A., 3,944,711.
Petterec, Robert E.; and Hutner, Mark A., 3,944,784.
Rechil, Edward G.; Summers, James E.; and Modi, Bhogilal M., 3,944,794.
Robertson, Donald A., 3,944,366.
Rodek, Victor, 3,944,896.
Smith, Richard E., 3,943,887.
Snelling, Christopher; Little, William S.; and Townsend, Robert H., 3,944,353.
Stange, Klaus K.; and Strobel, Erwin J., Jr., 3,944,212.
Starkweather, Gary K., 3,944,323.
Tutihasi, Simpei; and Nelson, Kyler F., 3,944,332.
Van Buskirk, Warren T., 3,944,365.
Yamada, Katuhiko: *See*—
Hasegawa, Goro; Nakamoto, Soichi; Watanabe, Yoshiaki; Taguchi, Tetsuya; and Yamada, Katuhiko, 3,945,024.
Yamada, Minoru, to Takachiho Koeki Kabushiki Kaisha. Pattern information memory using circulating memories. 3,944,989, Cl. 340-172.500.
Yamaguchi, Morio: *See*—
Inada, Kunio; and Yamaguchi, Morio, 3,943,851.
Yamaguchi, Takeshi; and Imai, Koichiro. Ski-mask. 3,943,574, Cl. 2-9.000.
Yamaguchi, Tatsuo: *See*—
Harao, Norio; Obata, Yoshiharu; and Yamaguchi, Tatsuo, 3,944,880.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Tomita, Fujihiko, 3,944,005.
Yamamori, Takahiro, to Nissan Motor Company Limited. Locking device for selector lever of automatic transmission to prevent car driving without wearing safety belt. 3,944,016, Cl. 180-82.00A.
Yamamoto, Mayjue A., to Durfee, Daniel G. Fail-safe disc brake with a clearance-takeup mechanism. 3,944,027, Cl. 188-71.900.
Yamauchi, Nobuharu: *See*—
Koyanagi, Haruo; Takahashi, Masayoshi; Yamauchi, Nobuharu; Matsumura, Masaji; and Morimoto, Katsuhide, 3,944,987.
Yamazaki, Mutsumi: *See*—
Nishiyama, Keizo; Yoshida, Yasushi; Yamazaki, Mutsumi; Iwata, Kohshi; and Tanaka, Yoshiaki, 3,944,514.
Yamazaki, Satoshi: *See*—
Kato, Takayuki; and Yamazaki, Satoshi, 3,943,759.
Yanagawa, Itiro: *See*—
Masuda, Naosuke; and Yanagawa, Itiro, 3,944,294.
Yanagida, Tokio; Saito, Ariyoshi; Hosoda, Naoyuki; and Kaneko, Fukuzo, to Mitsubishi Kinzoku Kabushiki Kaisha. Treatment of anode slime from copper electrolysis. 3,944,414, Cl. 75-99.000.
Yanagita, Tadafumi; Tamada, Teruo; and Tanaka, Yuma, to Toko, Inc. Apparatus for manufacturing high-frequency coil devices. 3,944,182, Cl. 249-83.000.
Yano, Tsutomu; and Watanabe, Akinori, to Matsushita Electric Industrial Company, Ltd. Acousto-optic filter. 3,944,334, Cl. 350-161.000.
Yano, Tsutomu: *See*—
Saito, Koetsu; Yano, Tsutomu; and Watanabe, Akinori, 3,944,335.
Yasuda, Isao: *See*—
Yasumoto, Seiichi; Kobayashi, Kazuhiko; Yasuda, Isao; and Itoh, Ken, 3,944,975.
Yasumoto, Seiichi; Kobayashi, Kazuhiko; Yasuda, Isao; and Itoh, Ken, to Hitachi, Ltd.; and Japanese National Railways. Signal checking system. 3,944,975, Cl. 340-146.1AB.
Yates, Harmon P. Tool set with slide-out and swing-out tools. 3,943,801, Cl. 81-71.000.
Yates, Patrick D. Show buggy. 3,944,243, Cl. 280-63.000.
Yen, Patrick P.: *See*—
Kotos, Peter; and Yen, Patrick P., 3,944,957.
Yen, Shiao-Ping S.: *See*—
Rembaum, Alan; Yen, Shiao-Ping S.; and Klein, Elias, 3,944,485.
Yevick, George J., to Personal Communications, Inc. Microfiche and reader. 3,944,350, Cl. 353-27.00R.
Yoda, Takuo, to Nifco Inc. Device for fixing pipes, rods and other elongated bodies. 3,944,177, Cl. 248-74.00A.
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Yokoyama, Taizo: *See*—
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,944,422.
Yoldas, Bulent E., to Owens-Illinois, Inc. Transparent activated nonparticulate alumina and method of preparing same. 3,944,658, Cl. 423-626.000.
Yonce, Everett R. Test connector with electrically conductive hook for testing electrical circuits of highway vehicles. 3,944,915, Cl. 324-51.000.
Yoshida, Hatsuyoshi: *See*—
Noba, Motoi; and Yoshida, Hatsuyoshi, 3,944,774.
Yoshida, Yasushi: *See*—
Nishiyama, Keizo; Yoshida, Yasushi; Yamazaki, Mutsumi; Iwata, Kohshi; and Tanaka, Yoshiaki, 3,944,514.

Yoshii, Tetsuji, to Matsushita Electric Industrial Company, Ltd. Magnetic recording and reproducing apparatus. 3,945,039, Cl. 360-137.000.
Yoshikawa, Shinsuke; Sasaki, Tohru; and Ichii, Takao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method of polarizing high molecular weight films. 3,943,614, Cl. 29-25.350.
Yoshioka, Masanobu: *See*—
Tamano, Motokazu; and Yoshioka, Masanobu, 3,944,790.
Young, John Russell, Jr.: *See*—
Schierding, Royce Gene; Young, John Russell, Jr.; and Vadnais, David Louis, 3,944,393.
Young, Raymond R.; and Michaelis, Jack H., to Swingline, Inc. Loose leaf binder. 3,944,374, Cl. 402-33.000.
Yu, Arthur J.; and Gallagher, Ruth E., to Stauffer Chemical Company. Acrylate-styrene-acrylonitrile composition and method of making the same. 3,944,631, Cl. 260-881.000.
Yu, Ying-Nien. Solar heat collector. 3,943,911, Cl. 126-271.000.
Yuzawa, Yoshihiko: *See*—
Sato, Wasuke; Iriko, Fumio; Yuzawa, Yoshihiko; Takeuchi, Setsuyuki; and Ibe, Nobukuni, 3,944,643.
Zabegalov, Georgy Vasilievich: *See*—
Polyanin, Valery Andreevich; Berkovich, Anatoly Jurievich; Zabegalov, Georgy Vasilievich; and Soin, Jury Konstantinovich, 3,944,089.
Zaffaroni, Alejandro: *See*—
Bashaw, John D.; Zaffaroni, Alejandro; and Michaels, Alan S., 3,944,064.
Zahnraderfabrik Renk Aktiengesellschaft, Firma: *See*—
Kummel, Louis; Morhart, Rudolf; and Pollak-Banda, Erich, 3,943,788.
Zahnradfabrik Friedrichshafen AG: *See*—
Mann, Egon, 3,943,789.
Winter, August; Mann, Egon; and Meyerle, Michael, 3,944,010.
Zambo, Janos: *See*—
Solymar, Karoly; Zambo, Janos; Orban nee Kelemen, Marika; Bujdoso, Erno; Feher, Ivan; Ozvald, Zoltan; Voros, Istvan; Ferenczi, Tibor; Toth, Pal; Lazar, Ferenc; Pinter, Tihamer; Sigmond, Gyorgy; Siklosi, Peter; Wentzely, Kalman; Lengyel, Laszlo; and Matyasi, Jozsef, 3,944,648.
Zaremskas, Alan A.: *See*—
Wolski, Francis; and Zaremskas, Alan A., 3,943,804.
Zdanys, John; and Kelver, William L., Jr., to CTS Corporation. Switch assembly having slider actuator insulating plate inserted between normally closed contacts. 3,944,760, Cl. 200-6.0BB.
Zeffren, Eugene: *See*—
Diehl, Francis Louvaine; Zeffren, Eugene; and Milbrada, Edward John, 3,944,470.
Zenith Radio Corporation: *See*—
Eilers, Carl G., 3,944,747.
Kaplan, Sam H., 3,944,867.
Zettergren, Ted, to Tedeco AG. Control system. 3,943,973, Cl. 137-624.150.
Zhoglo, Viktor Olimpievich: *See*—
Misulovin, Leonid Yakovlevich; Panin, Igor Ivanovich; Soloveichik, Yakov Girshevich; Kovalev, Leonid Anisimovich; and Zhoglo, Viktor Olimpievich, 3,944,956.
Zwicker, Kurt, to Dynamit Nobel Aktiengesellschaft. Ejection head with active elements for rockets. 3,943,854, Cl. 102-34.400.
2001 Plastics, Ltd.: *See*—
Olson, Herbert O., 3,944,228.

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 24,017	3,914,140	Oct. 21, 1975	B 289,175	3,924,309	Dec. 9, 1975
B 24,018	3,914,206	Oct. 21, 1975	B 289,471	3,917,184	Nov. 4, 1975
B 64,868	3,914,141	Oct. 21, 1975	B 289,523	3,921,166	Nov. 18, 1975
B 78,331	3,914,142	Oct. 21, 1975	B 289,883	3,925,063	Dec. 9, 1975
B 112,422	3,913,484	Oct. 21, 1975	B 290,328	3,924,838	Dec. 9, 1975
B 150,560	3,913,654	Oct. 21, 1975	B 291,104	3,925,007	Dec. 9, 1975
B 176,995	3,915,773	Oct. 28, 1975	B 291,694	3,925,339	Dec. 9, 1975
B 178,475	3,944,602	Mar. 16, 1976	B 292,054	3,915,877	Oct. 28, 1975
B 189,772	3,925,367	Dec. 9, 1975	B 292,126	3,914,465	Oct. 21, 1975
B 189,773	3,925,405	Dec. 9, 1975	B 292,140	3,914,340	Oct. 21, 1975
B 190,679	3,925,346	Dec. 9, 1975	B 292,300	3,927,167	Dec. 16, 1975
B 198,810	3,916,043	Oct. 28, 1975	B 292,563	3,923,653	Dec. 2, 1975
B 204,161	3,924,605	Dec. 9, 1975	B 293,378	3,923,725	Dec. 2, 1975
B 207,272	3,914,123	Oct. 21, 1975	B 293,437	3,913,414	Oct. 21, 1975
B 211,786	3,914,300	Oct. 21, 1975	B 294,103	3,924,396	Dec. 9, 1975
B 213,211	3,925,269	Dec. 9, 1975	B 294,579	3,916,737	Nov. 4, 1975
B 220,683	3,914,471	Oct. 21, 1975	B 294,673	3,916,023	Oct. 28, 1975
B 222,188	3,914,739	Oct. 21, 1975	B 295,481	3,921,593	Nov. 25, 1975
B 223,621	3,925,526	Dec. 9, 1975	B 295,674	3,916,107	Oct. 28, 1975
B 224,323	3,925,476	Dec. 9, 1975	B 295,860	3,923,880	Dec. 2, 1975
B 233,383	3,925,424	Dec. 9, 1975	B 299,267	3,917,106	Nov. 4, 1975
B 233,741	3,925,326	Dec. 9, 1975	B 300,353	3,921,734	Nov. 25, 1975
B 235,011	3,925,086	Dec. 9, 1975	B 302,271	3,929,130	Dec. 30, 1975
B 235,925	3,924,949	Dec. 9, 1975	B 302,692	3,924,598	Dec. 9, 1975
B 236,609	3,925,187	Dec. 9, 1975	B 302,836	3,923,573	Dec. 2, 1975
B 237,953	3,924,051	Dec. 2, 1975	B 302,998	3,928,233	Dec. 23, 1975
B 239,289	3,922,711	Nov. 25, 1975	B 303,011	3,930,188	Dec. 30, 1975
B 241,433	3,923,711	Dec. 2, 1975	B 303,655	3,924,642	Dec. 9, 1975
B 245,194	3,919,179	Nov. 11, 1975	B 303,702	3,914,131	Oct. 21, 1975
B 248,916	3,920,862	Nov. 18, 1975	B 304,687	3,924,783	Dec. 9, 1975
B 251,109	3,914,148	Oct. 21, 1975	B 305,417	3,915,882	Oct. 28, 1975
B 251,635	3,914,149	Oct. 21, 1975	B 305,868	3,921,463	Nov. 25, 1975
B 252,947	3,923,803	Dec. 2, 1975	B 305,881	3,923,478	Dec. 2, 1975
B 254,211	3,917,677	Nov. 4, 1975	B 306,829	3,925,411	Dec. 9, 1975
B 254,708	3,923,878	Dec. 2, 1975	B 306,938	3,916,050	Oct. 28, 1975
B 255,756	3,923,781	Dec. 2, 1975	B 307,677	3,915,276	Oct. 28, 1975
B 256,334	3,924,988	Dec. 9, 1975	B 308,661	3,924,349	Dec. 9, 1975
B 256,936	3,925,513	Dec. 9, 1975	B 308,892	3,919,624	Nov. 11, 1975
B 258,687	3,914,221	Oct. 21, 1975	B 309,207	3,914,743	Oct. 21, 1975
B 259,236	3,924,874	Dec. 9, 1975	B 309,499	3,922,002	Nov. 25, 1975
B 259,274	3,928,688	Dec. 23, 1975	B 309,681	3,927,374	Dec. 16, 1975
B 260,455	3,925,634	Dec. 9, 1975	B 309,755	3,919,468	Nov. 11, 1975
B 260,945	3,925,250	Dec. 9, 1975	B 309,756	3,914,136	Oct. 21, 1975
B 261,378	3,913,468	Oct. 21, 1975	B 309,860	3,922,485	Nov. 25, 1975
B 261,828	3,925,551	Dec. 9, 1975	B 310,149	3,924,705	Dec. 9, 1975
B 262,241	3,925,528	Dec. 9, 1975	B 310,271	3,923,689	Dec. 2, 1975
B 262,287	3,921,209	Nov. 18, 1975	B 311,313	3,925,142	Dec. 9, 1975
B 262,378	3,914,410	Oct. 21, 1975	B 311,317	3,918,975	Nov. 11, 1975
B 264,257	3,928,665	Dec. 23, 1975	B 311,413	3,925,515	Dec. 9, 1975
B 264,833	3,923,566	Dec. 2, 1975	B 311,910	3,924,357	Dec. 9, 1975
B 265,369	3,925,245	Dec. 9, 1975	B 311,911	3,925,233	Dec. 9, 1975
B 265,727	3,914,479	Oct. 21, 1975	B 312,139	3,925,530	Dec. 9, 1975
B 265,862	3,915,915	Oct. 28, 1975	B 312,477	3,923,714	Dec. 2, 1975
B 266,195	3,923,599	Dec. 2, 1975	B 313,098	3,925,045	Dec. 9, 1975
B 269,673	3,914,377	Oct. 21, 1975	B 313,531	3,925,548	Dec. 9, 1975
B 270,089	3,923,875	Dec. 2, 1975	B 313,594	3,924,626	Dec. 9, 1975
B 271,104	3,925,400	Dec. 9, 1975	B 313,900	3,915,932	Oct. 28, 1975
B 274,945	3,924,992	Dec. 9, 1975	B 314,049	3,920,588	Nov. 18, 1975
B 275,426	3,925,168	Dec. 9, 1975	B 314,255	3,923,764	Dec. 2, 1975
B 276,271	3,916,028	Oct. 28, 1975	B 314,271	3,921,845	Nov. 25, 1975
B 276,560	3,916,030	Oct. 28, 1975	B 314,489	3,925,016	Dec. 9, 1975
B 277,449	3,924,048	Dec. 2, 1975	B 314,800	3,930,087	Dec. 30, 1975
B 278,491	3,921,170	Nov. 18, 1975	B 314,977	3,923,459	Dec. 2, 1975
B 278,991	3,914,469	Oct. 21, 1975	B 315,363	3,920,673	Nov. 18, 1975
B 279,583	3,923,749	Dec. 2, 1975	B 315,397	3,923,963	Dec. 2, 1975
B 280,015	3,925,378	Dec. 9, 1975	B 315,731	3,914,108	Oct. 21, 1975
B 280,395	3,919,604	Nov. 11, 1975	B 316,014	3,920,861	Nov. 18, 1975
B 281,341	3,920,643	Nov. 18, 1975	B 316,239	3,913,546	Oct. 21, 1975
B 281,943	3,924,013	Dec. 2, 1975	B 316,917	3,925,494	Dec. 9, 1975
B 282,081	3,913,483	Oct. 21, 1975	B 317,080	3,925,324	Dec. 9, 1975
B 282,252	3,924,997	Dec. 9, 1975	B 317,347	3,923,552	Dec. 2, 1975
B 283,124	3,923,512	Dec. 2, 1975	B 317,624	3,925,167	Dec. 9, 1975
B 283,300	3,925,011	Dec. 9, 1975	B 318,195	3,915,699	Oct. 28, 1975
B 284,297	3,913,722	Oct. 21, 1975	B 318,618	3,915,365	Oct. 28, 1975
B 285,200	3,923,680	Dec. 2, 1975	B 318,640	3,925,186	Dec. 9, 1975
B 285,796	3,914,303	Oct. 21, 1975	B 318,745	3,916,571	Nov. 4, 1975
B 286,499	3,914,129	Oct. 21, 1975	B 319,226	3,925,082	Dec. 9, 1975
B 286,614	3,924,696	Dec. 9, 1975	B 319,339	3,916,056	Oct. 28, 1975
B 286,913	3,928,696	Dec. 23, 1975	B 319,402	3,919,568	Nov. 11, 1975
B 287,164	3,914,139	Oct. 21, 1975	B 319,414	3,928,666	Dec. 23, 1975
B 287,270	3,924,825	Dec. 9, 1975	B 320,261	3,924,033	Dec. 2, 1975
B 287,275	3,925,141	Dec. 9, 1975	B 320,452	3,925,083	Dec. 9, 1975
B 287,373	3,918,568	Nov. 11, 1975	B 320,603	3,915,571	Oct. 28, 1975
B 288,018	3,925,239	Dec. 9, 1975	B 321,018	3,921,623	Nov. 25, 1975
B 288,627	3,916,179	Oct. 28, 1975	B 321,101	3,917,163	Nov. 4, 1975
B 288,638	3,925,132	Dec. 9, 1975	B 321,938	3,923,889	Dec. 2, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 322,182	3,925,390	Dec. 9, 1975	B 346,585	3,913,820	Oct. 21, 1975
B 322,239	3,920,973	Nov. 18, 1975	B 346,613	3,923,545	Dec. 2, 1975
B 322,564	3,914,373	Oct. 21, 1975	B 346,901	3,915,583	Oct. 28, 1975
B 322,611	3,920,863	Nov. 18, 1975	B 348,083	3,923,774	Dec. 2, 1975
B 322,777	3,924,382	Dec. 9, 1975	B 348,383	3,923,452	Dec. 2, 1975
B 323,127	3,923,967	Dec. 2, 1975	B 348,495	3,914,654	Oct. 21, 1975
B 323,191	3,914,566	Oct. 21, 1975	B 348,558	3,914,109	Oct. 21, 1975
B 323,203	3,916,165	Oct. 28, 1975	B 349,141	3,915,363	Oct. 28, 1975
B 323,568	3,920,536	Nov. 18, 1975	B 349,177	3,914,033	Oct. 21, 1975
B 323,666	3,924,568	Dec. 9, 1975	B 349,231	3,915,831	Oct. 28, 1975
B 324,495	3,928,664	Dec. 23, 1975	B 349,321	3,916,103	Oct. 28, 1975
B 324,503	3,928,524	Dec. 23, 1975	B 349,948	3,914,557	Oct. 21, 1975
B 324,505	3,925,294	Dec. 9, 1975	B 350,025	3,927,415	Dec. 16, 1975
B 324,739	3,924,990	Dec. 9, 1975	B 350,143	3,924,419	Dec. 9, 1975
B 324,879	3,923,538	Dec. 2, 1975	B 350,219	3,917,802	Nov. 4, 1975
B 325,102	3,924,355	Dec. 9, 1975	B 350,245	3,914,331	Oct. 21, 1975
B 325,262	3,921,304	Nov. 25, 1975	B 350,523	3,924,726	Dec. 9, 1975
B 326,514	3,925,080	Dec. 9, 1975	B 350,589	3,927,419	Dec. 16, 1975
B 327,109	3,925,350	Dec. 9, 1975	B 350,708	3,923,871	Dec. 2, 1975
B 327,363	3,923,504	Dec. 2, 1975	B 350,843	3,915,461	Oct. 28, 1975
B 327,612	3,925,620	Dec. 9, 1975	B 351,055	3,914,074	Oct. 21, 1975
B 327,674	3,918,540	Nov. 11, 1975	B 351,218	3,914,186	Oct. 21, 1975
B 327,899	3,925,674	Dec. 9, 1975	B 351,222	3,921,179	Nov. 18, 1975
B 328,164	3,914,703	Oct. 21, 1975	B 351,348	3,923,563	Dec. 2, 1975
B 328,200	3,916,031	Oct. 28, 1975	B 351,421	3,914,733	Oct. 21, 1975
B 328,205	3,914,106	Oct. 21, 1975	B 351,493	3,914,758	Oct. 21, 1975
B 328,210	3,914,275	Oct. 21, 1975	B 351,535	3,915,239	Oct. 28, 1975
B 328,870	3,916,486	Nov. 4, 1975	B 351,665	3,919,701	Nov. 11, 1975
B 329,115	3,924,727	Dec. 9, 1975	B 351,672	3,914,000	Oct. 21, 1975
B 329,476	3,920,562	Nov. 18, 1975	B 351,735	3,913,385	Oct. 21, 1975
B 329,612	3,925,128	Dec. 9, 1975	B 351,863	3,914,700	Oct. 21, 1975
B 329,787	3,920,688	Nov. 18, 1975	B 351,883	3,924,657	Dec. 9, 1975
B 329,816	3,923,947	Dec. 2, 1975	B 351,926	3,914,133	Oct. 21, 1975
B 330,536	3,925,452	Dec. 9, 1975	B 351,939	3,913,480	Oct. 21, 1975
B 330,828	3,913,589	Oct. 21, 1975	B 352,445	3,928,746	Dec. 23, 1975
B 331,417	3,914,157	Oct. 21, 1975	B 352,934	3,913,692	Oct. 21, 1975
B 331,557	3,916,577	Nov. 4, 1975	B 352,950	3,922,590	Nov. 25, 1975
B 331,895	3,916,403	Oct. 28, 1975	B 352,965	3,921,926	Nov. 25, 1975
B 332,527	3,924,017	Dec. 2, 1975	B 353,317	3,916,446	Nov. 4, 1975
B 332,811	3,924,359	Dec. 9, 1975	B 353,387	3,924,404	Dec. 9, 1975
B 333,876	3,921,208	Nov. 18, 1975	B 353,546	3,913,273	Oct. 21, 1975
B 333,928	3,927,172	Dec. 16, 1975	B 354,008	3,925,081	Dec. 9, 1975
B 334,251	3,924,719	Dec. 9, 1975	B 354,098	3,925,547	Dec. 9, 1975
B 334,868	3,919,469	Nov. 11, 1975	B 354,145	3,927,279	Dec. 16, 1975
B 334,985	3,923,912	Dec. 2, 1975	B 354,296	3,914,580	Oct. 21, 1975
B 335,670	3,928,686	Dec. 23, 1975	B 354,510	3,928,658	Dec. 23, 1975
B 335,741	3,925,615	Dec. 9, 1975	B 354,889	3,913,204	Oct. 21, 1975
B 335,773	3,920,953	Nov. 18, 1975	B 354,979	3,914,251	Oct. 21, 1975
B 336,129	3,923,606	Dec. 2, 1975	B 355,095	3,925,656	Dec. 9, 1975
B 336,243	3,925,422	Dec. 9, 1975	B 355,269	3,914,561	Oct. 21, 1975
B 336,345	3,925,179	Dec. 9, 1975	B 355,510	3,913,704	Oct. 21, 1975
B 336,652	3,914,211	Oct. 21, 1975	B 355,595	3,925,649	Dec. 9, 1975
B 336,902	3,918,897	Nov. 11, 1975	B 355,876	3,925,685	Dec. 9, 1975
B 336,946	3,919,425	Nov. 11, 1975	B 356,032	3,928,636	Dec. 23, 1975
B 336,978	3,923,968	Dec. 2, 1975	B 356,253	3,925,025	Dec. 9, 1975
B 337,235	3,919,386	Nov. 11, 1975	B 356,602	3,927,393	Dec. 16, 1975
B 337,409	3,925,258	Dec. 9, 1975	B 356,724	3,924,586	Dec. 9, 1975
B 337,442	3,913,658	Oct. 21, 1975	B 357,039	3,924,406	Dec. 9, 1975
B 337,703	3,914,690	Oct. 21, 1975	B 357,057	3,913,738	Oct. 21, 1975
B 337,787	3,923,506	Dec. 2, 1975	B 357,131	3,924,453	Dec. 9, 1975
B 339,057	3,924,822	Dec. 9, 1975	B 357,402	3,914,180	Oct. 21, 1975
B 339,218	3,925,121	Dec. 9, 1975	B 357,682	3,924,973	Dec. 9, 1975
B 339,699	3,933,527	Jan. 20, 1976	B 357,803	3,919,470	Nov. 11, 1975
B 339,838	3,930,221	Dec. 30, 1975	B 358,174	3,924,958	Dec. 9, 1975
B 340,212	3,922,645	Nov. 25, 1975	B 358,244	3,913,411	Oct. 21, 1975
B 340,833	3,925,208	Dec. 9, 1975	B 358,311	3,923,561	Dec. 2, 1975
B 341,579	3,913,363	Oct. 21, 1975	B 358,939	3,924,713	Dec. 9, 1975
B 342,084	3,928,694	Dec. 23, 1975	B 359,174	3,914,117	Oct. 21, 1975
B 342,423	3,925,334	Dec. 9, 1975	B 359,187	3,924,525	Dec. 9, 1975
B 342,886	3,923,507	Dec. 2, 1975	B 359,540	3,915,235	Oct. 28, 1975
B 343,136	3,919,453	Nov. 11, 1975	B 359,740	3,936,212	Feb. 3, 1976
B 343,240	3,925,693	Dec. 9, 1975	B 359,791	3,929,430	Dec. 30, 1975
B 343,506	3,916,021	Oct. 28, 1975	B 359,825	3,921,344	Nov. 25, 1975
B 343,577	3,921,165	Nov. 18, 1975	B 359,946	3,914,132	Oct. 21, 1975
B 344,203	3,928,719	Dec. 23, 1975	B 359,947	3,914,653	Oct. 21, 1975
B 344,479	3,924,042	Dec. 2, 1975	B 360,208	3,923,750	Dec. 2, 1975
B 345,060	3,916,018	Oct. 28, 1975	B 360,296	3,916,720	Nov. 4, 1975
B 345,384	3,916,146	Oct. 28, 1975	B 360,719	3,915,715	Oct. 28, 1975
B 345,390	3,940,343	Feb. 24, 1976	B 360,910	3,925,696	Dec. 9, 1975
B 345,422	3,914,392	Oct. 21, 1975	B 361,265	3,923,569	Dec. 2, 1975
B 345,527	3,927,365	Dec. 16, 1975	B 361,443	3,927,405	Dec. 16, 1975
B 345,567	3,913,985	Oct. 21, 1975	B 361,569	3,914,554	Oct. 21, 1975
B 346,165	3,913,293	Oct. 21, 1975	B 361,604	3,922,702	Nov. 25, 1975
B 346,210	3,916,142	Oct. 28, 1975	B 361,734	3,915,764	Oct. 28, 1975
B 346,350	3,915,824	Oct. 28, 1975	B 362,589	3,914,012	Oct. 21, 1975
B 346,487	3,927,406	Dec. 16, 1975	B 363,205	3,923,744	Dec. 2, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 363,337	3,928,639	Dec. 23, 1975	B 387,363	3,927,378	Dec. 16, 1975
B 363,457	3,922,595	Nov. 25, 1975	B 387,687	3,918,151	Nov. 11, 1975
B 363,674	3,929,716	Dec. 30, 1975	B 387,761	3,914,245	Oct. 21, 1975
B 363,892	3,913,395	Oct. 21, 1975	B 387,790	3,925,380	Dec. 9, 1975
B 363,962	3,921,826	Nov. 25, 1975	B 387,818	3,918,935	Nov. 11, 1975
B 364,022	3,913,499	Oct. 21, 1975	B 388,580	3,923,712	Dec. 2, 1975
B 364,163	3,916,092	Oct. 28, 1975	B 389,070	3,914,171	Oct. 21, 1975
B 364,241	3,916,668	Nov. 4, 1975	B 389,285	3,914,631	Oct. 21, 1975
B 364,334	3,924,670	Dec. 9, 1975	B 389,327	3,924,504	Dec. 9, 1975
B 364,528	3,919,510	Nov. 11, 1975	B 389,639	3,914,626	Oct. 21, 1975
B 364,786	3,921,673	Nov. 25, 1975	B 389,726	3,921,010	Nov. 18, 1975
B 364,910	3,925,335	Dec. 9, 1975	B 389,807	3,922,623	Nov. 25, 1975
B 365,490	3,918,527	Nov. 11, 1975	B 389,932	3,913,268	Oct. 21, 1975
B 365,834	3,914,702	Oct. 21, 1975	B 389,933	3,913,267	Oct. 21, 1975
B 365,841	3,925,628	Dec. 9, 1975	B 390,679	3,913,668	Oct. 21, 1975
B 365,855	3,917,258	Nov. 4, 1975	B 390,732	3,913,878	Oct. 21, 1975
B 366,287	3,924,946	Dec. 9, 1975	B 391,184	3,914,214	Oct. 21, 1975
B 366,402	3,928,053	Dec. 23, 1975	B 391,210	3,914,220	Oct. 21, 1975
B 366,589	3,914,719	Oct. 21, 1975	B 391,437	3,915,416	Oct. 28, 1975
B 367,021	3,914,752	Oct. 21, 1975	B 391,509	3,925,175	Dec. 9, 1975
B 367,040	3,924,775	Dec. 9, 1975	B 391,675	3,916,017	Oct. 28, 1975
B 367,661	3,914,158	Oct. 21, 1975	B 392,154	3,923,809	Dec. 2, 1975
B 367,739	3,923,648	Dec. 2, 1975	B 392,242	3,926,636	Dec. 16, 1975
B 367,812	3,924,789	Dec. 9, 1975	B 392,696	3,916,175	Oct. 28, 1975
B 368,081	3,924,691	Dec. 9, 1975	B 392,732	3,914,903	Oct. 21, 1975
B 368,387	3,924,923	Dec. 9, 1975	B 392,753	3,916,341	Oct. 28, 1975
B 368,392	3,913,812	Oct. 21, 1975	B 392,894	3,914,763	Oct. 21, 1975
B 368,397	3,914,677	Oct. 21, 1975	B 393,163	3,914,535	Oct. 21, 1975
B 368,862	3,925,549	Dec. 9, 1975	B 393,970	3,914,638	Oct. 21, 1975
B 369,563	3,924,449	Dec. 9, 1975	B 394,088	3,914,740	Oct. 21, 1975
B 369,607	3,923,786	Dec. 2, 1975	B 394,188	3,924,591	Dec. 9, 1975
B 369,997	3,913,533	Oct. 21, 1975	B 394,300	3,914,159	Oct. 21, 1975
B 370,706	3,925,242	Dec. 9, 1975	B 394,712	3,916,306	Oct. 28, 1975
B 371,073	3,930,135	Dec. 30, 1975	B 395,478	3,922,577	Nov. 25, 1975
B 371,085	3,923,783	Dec. 2, 1975	B 395,496	3,919,435	Nov. 11, 1975
B 371,787	3,921,217	Nov. 18, 1975	B 395,671	3,920,418	Nov. 18, 1975
B 371,805	3,914,433	Oct. 21, 1975	B 395,889	3,913,190	Oct. 21, 1975
B 371,836	3,923,541	Dec. 2, 1975	B 396,025	3,913,869	Oct. 21, 1975
B 372,823	3,924,660	Dec. 9, 1975	B 396,551	3,921,929	Nov. 25, 1975
B 373,297	3,924,436	Dec. 9, 1975	B 397,027	3,923,736	Dec. 2, 1975
B 373,326	3,920,433	Nov. 18, 1975	B 397,527	3,913,488	Oct. 21, 1975
B 373,428	3,915,511	Oct. 28, 1975	B 397,990	3,914,848	Oct. 28, 1975
B 375,220	3,920,417	Nov. 18, 1975	B 398,262	3,913,481	Oct. 21, 1975
B 375,652	3,921,303	Nov. 25, 1975	B 398,551	3,924,924	Dec. 9, 1975
B 376,504	3,914,570	Oct. 21, 1975	B 398,597	3,913,743	Oct. 21, 1975
B 376,654	3,922,513	Nov. 25, 1975	B 398,625	3,920,996	Nov. 18, 1975
B 376,742	3,924,392	Dec. 9, 1975	B 399,292	3,914,810	Oct. 28, 1975
B 376,799	3,913,955	Oct. 21, 1975	B 399,304	3,919,567	Nov. 11, 1975
B 377,172	3,918,255	Nov. 11, 1975	B 399,349	3,925,694	Dec. 9, 1975
B 377,683	3,924,433	Dec. 9, 1975	B 399,766	3,915,667	Oct. 28, 1975
B 377,833	3,913,884	Oct. 21, 1975	B 400,080	3,925,163	Dec. 9, 1975
B 377,869	3,917,002	Nov. 4, 1975	B 400,293	3,923,719	Dec. 2, 1975
B 378,621	3,923,840	Dec. 2, 1975	B 400,310	3,915,507	Oct. 28, 1975
B 379,038	3,923,994	Dec. 2, 1975	B 401,133	3,924,443	Dec. 9, 1975
B 379,172	3,914,379	Oct. 21, 1975	B 401,992	3,924,898	Dec. 9, 1975
B 379,282	3,913,462	Oct. 21, 1975	B 402,065	3,925,413	Dec. 9, 1975
B 379,955	3,913,157	Oct. 21, 1975	B 402,555	3,914,688	Oct. 21, 1975
B 380,014	3,921,915	Nov. 25, 1975	B 403,140	3,913,486	Oct. 21, 1975
B 380,141	3,925,161	Dec. 9, 1975	B 403,355	3,913,352	Oct. 21, 1975
B 380,310	3,921,048	Nov. 18, 1975	B 403,990	3,914,684	Oct. 21, 1975
B 380,312	3,913,953	Oct. 21, 1975	B 403,996	3,916,016	Oct. 28, 1975
B 380,338	3,924,873	Dec. 9, 1975	B 404,290	3,924,918	Dec. 9, 1975
B 380,446	3,923,836	Dec. 2, 1975	B 404,437	3,915,200	Oct. 28, 1975
B 380,900	3,913,307	Oct. 21, 1975	B 405,136	3,915,565	Oct. 28, 1975
B 380,926	3,925,095	Dec. 9, 1975	B 405,137	3,915,566	Oct. 28, 1975
B 381,074	3,919,583	Nov. 11, 1975	B 405,160	3,924,821	Dec. 9, 1975
B 381,632	3,914,732	Oct. 21, 1975	B 405,248	3,926,294	Dec. 16, 1975
B 381,847	3,921,152	Nov. 18, 1975	B 405,305	3,922,111	Nov. 25, 1975
B 382,018	3,929,742	Dec. 30, 1975	B 405,360	3,913,403	Oct. 21, 1975
B 382,021	3,913,212	Oct. 21, 1975	B 405,495	3,924,577	Dec. 9, 1975
B 382,261	3,914,991	Oct. 28, 1975	B 405,938	3,920,109	Nov. 18, 1975
B 382,290	3,924,717	Dec. 9, 1975	B 406,065	3,914,199	Oct. 21, 1975
B 382,783	3,919,527	Nov. 11, 1975	B 406,357	3,924,529	Dec. 9, 1975
B 382,798	3,924,435	Dec. 9, 1975	B 407,736	3,924,463	Dec. 9, 1975
B 382,840	3,922,007	Nov. 25, 1975	B 407,357	3,924,614	Dec. 9, 1975
B 383,465	3,927,412	Dec. 16, 1975	B 407,728	3,925,240	Dec. 9, 1975
B 383,532	3,914,246	Oct. 21, 1975	B 408,487	3,924,046	Dec. 2, 1975
B 383,581	3,925,318	Dec. 9, 1975	B 408,749	3,914,116	Oct. 21, 1975
B 384,499	3,925,135	Dec. 9, 1975	B 409,026	3,925,497	Dec. 9, 1975
B 384,658	3,913,452	Oct. 21, 1975	B 409,220	3,915,648	Oct. 28, 1975
B 384,773	3,915,416	Oct. 28, 1975	B 409,251	3,922,620	Nov. 25, 1975
B 385,210	3,913,406	Oct. 21, 1975	B 409,657	3,927,362	Dec. 16, 1975
B 386,403	3,924,895	Dec. 9, 1975	B 409,816	3,921,317	Nov. 25, 1975
B 386,592	3,925,305	Dec. 9, 1975	B 410,062	3,923,855	Dec. 2, 1975
B 387,039	3,924,510	Dec. 9, 1975	B 410,168	3,914,717	Oct. 21, 1975
B 387,331	3,913,701	Oct. 21, 1975	B 411,145	3,914,168	Oct. 21, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 411,356	3,919,649	Nov. 11, 1975
B 411,483	3,925,196	Dec. 9, 1975
B 411,633	3,914,741	Oct. 21, 1975
B 412,516	3,927,417	Dec. 16, 1975
B 412,619	3,925,292	Dec. 9, 1975
B 412,867	3,924,587	Dec. 9, 1975
B 413,006	3,914,850	Oct. 28, 1975
B 413,546	3,924,314	Dec. 9, 1975
B 414,129	3,925,484	Dec. 9, 1975
B 414,288	3,925,537	Dec. 9, 1975
B 415,113	3,915,717	Oct. 28, 1975
B 415,124	3,915,944	Oct. 28, 1975
B 415,845	3,925,076	Dec. 9, 1975
B 415,847	3,914,208	Oct. 21, 1975
B 415,957	3,925,635	Dec. 9, 1975
B 415,977	3,927,359	Dec. 16, 1975
B 416,598	3,923,473	Dec. 2, 1975
B 416,832	3,924,975	Dec. 9, 1975
B 416,710	3,923,746	Dec. 2, 1975
B 416,933	3,924,968	Dec. 9, 1975
B 417,299	3,918,235	Nov. 11, 1975
B 418,121	3,925,023	Dec. 9, 1975
B 418,153	3,925,251	Dec. 9, 1975
B 418,302	3,913,252	Oct. 21, 1975
B 419,327	3,921,197	Nov. 18, 1975
B 419,481	3,924,970	Dec. 9, 1975
B 420,016	3,914,572	Oct. 21, 1975
B 420,148	3,927,414	Dec. 16, 1975
B 420,514	3,923,929	Dec. 2, 1975
B 420,568	3,925,069	Dec. 9, 1975
B 421,026	3,914,785	Oct. 21, 1975
B 421,362	3,924,817	Dec. 9, 1975
B 421,383	3,925,047	Dec. 9, 1975
B 421,797	3,914,023	Oct. 21, 1975
B 422,399	3,928,656	Dec. 23, 1975
B 422,467	3,924,804	Dec. 9, 1975
B 422,949	3,921,873	Nov. 25, 1975
B 424,415	3,919,458	Nov. 11, 1975
B 424,462	3,920,522	Nov. 18, 1975
B 424,572	3,924,979	Dec. 9, 1975
B 424,748	3,924,395	Dec. 9, 1975
B 425,035	3,914,025	Oct. 21, 1975
B 425,345	3,922,015	Nov. 25, 1975
B 425,470	3,923,796	Dec. 2, 1975
B 425,539	3,916,742	Nov. 4, 1975
B 425,541	3,914,051	Oct. 21, 1975
B 425,572	3,923,822	Dec. 2, 1975
B 427,631	3,921,433	Nov. 25, 1975
B 428,177	3,914,624	Oct. 21, 1975
B 428,795	3,921,056	Nov. 18, 1975
B 429,442	3,923,485	Dec. 2, 1975
B 430,106	3,918,941	Nov. 11, 1975
B 430,140	3,922,084	Nov. 25, 1975
B 430,798	3,918,204	Nov. 11, 1975
B 430,944	3,922,096	Nov. 25, 1975
B 432,373	3,919,670	Nov. 11, 1975
B 433,587	3,914,567	Oct. 21, 1975
B 435,343	3,919,244	Nov. 11, 1975
B 435,844	3,925,170	Dec. 9, 1975
B 437,173	3,924,627	Dec. 9, 1975
B 437,172	3,913,251	Oct. 21, 1975
B 437,195	3,914,618	Oct. 21, 1975
B 437,450	3,922,479	Nov. 25, 1975
B 438,053	3,916,013	Oct. 28, 1975
B 438,706	3,925,050	Dec. 9, 1975
B 439,168	3,919,676	Nov. 11, 1975
B 439,669	3,921,499	Nov. 25, 1975
B 440,898	3,921,789	Nov. 25, 1975
B 441,024	3,913,629	Oct. 21, 1975
B 441,416	3,913,851	Oct. 21, 1975
B 442,280	3,914,054	Oct. 21, 1975
B 442,859	3,918,570	Nov. 11, 1975
B 442,919	3,925,483	Dec. 9, 1975
B 444,614	3,927,996	Dec. 23, 1975
B 445,471	3,914,711	Oct. 21, 1975
B 445,740	3,923,612	Dec. 2, 1975
B 448,571	3,924,760	Dec. 9, 1975
B 449,647	3,916,797	Nov. 4, 1975
B 450,499	3,920,526	Nov. 18, 1975
B 450,546	3,924,417	Dec. 9, 1975
B 450,927	3,913,844	Oct. 21, 1975
B 455,520	3,922,543	Nov. 25, 1975
B 455,775	3,914,356	Oct. 21, 1975
B 456,346	3,914,531	Oct. 21, 1975
B 459,425	3,928,773	Dec. 23, 1975
B 461,872	3,919,586	Nov. 11, 1975
B 467,684	3,915,119	Oct. 28, 1975
B 468,198	3,925,340	Dec. 9, 1975

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF MARCH, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Borgs Fabriks Aktiebolag: *See*—
Myhr, Lars Halvar; and Svenson, Lars-Ake Erling, Re. 28,736.

Deinert, Roedolf Hendrik: *See*—
Kulberg, Gerardus Huibrecht; and Deinert, Roedolf Hendrik, Re. 28,738.

G. D. Searle & Co.: *See*—
Kulberg, Gerardus Huibrecht; and Deinert, Roedolf Hendrik, Re. 28,738.

Koss, Vernon J.: *See*—
Lund, Robert S.; and Koss, Vernon J., Re. 28,735.

Kulberg, Gerardus Huibrecht; and Deinert, Roedolf Hendrik, to G. D. Searle & Co. Quench correction in liquid scintillation counting. Re. 28,738, Cl. 250-362.000.

Lund, Robert S.; and Koss, Vernon J., to Pettibone Corporation. Cyclicly-operable machine adapted to produce and assemble cope and drag mold parts. Re. 28,735, Cl. 164-195.000.

Myhr, Lars Halvar; and Svenson, Lars-Ake Erling, to Borgs Fabriks Aktiebolag. Means and method for regulating a hydraulic energy absorbing device. Re. 28,736, Cl. 188-296.000.

Pettibone Corporation: *See*—
Lund, Robert S.; and Koss, Vernon J., Re. 28,735.

Procter & Gamble Company, The: *See*—
Yetter, Jerry Joseph, Re. 28,737.

Svenson, Lars-Ake Erling: *See*—
Myhr, Lars Halvar; and Svenson, Lars-Ake Erling, Re. 28,736.

Wycoff, Keith H. Tone control circuit having a frequency controllable filter. Re. 28,739, Cl. 325-55.000.

Yetter, Jerry Joseph, to Procter & Gamble Company, The. Process for synthesizing specific complete mixed polyol esters. Re. 28,737, Cl. 260-410.700.

LIST OF PLANT PATENTEES

Armstrong Nurseries, Inc.: *See*—
McGredy, Samuel, IV. 3,845.

Grob, Adolf, to Mikkelsens, Inc. Kalanchoe plant. 3,843, 3–16–76, Cl. 68.

International Turf, Inc.: *See*—
Whiting, Hubert F. 3,842.

McGredy, Samuel, IV., to Armstrong Nurseries, Inc. Rose plant. 3,845, 3–16–76, Cl. 11.

Mikkelsens, Inc.: *See*—
Grob, Adolf. 3,843.

Mikkelsen, James C., to Mikkelsens, Inc. Begonia plant 3,841, 3–16–76, Cl. 68.

Moore, Ralph S. Miniature rose plant. 3,844, 3–16–76, Cl. 8.

Whiting, Hubert F., to International Turf, Inc. Paspalum vaginatum grass plant. 3,842, 3–16–76, Cl. 88.

INDEX OF DESIGN APPLICANTS AND ASSIGNEES

OF

DESIGN APPLICATIONS PUBLISHED ON THE 16TH DAY OF MARCH 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Note that these entries will not be in numerical order by document (publication) number throughout the section as for patents; numerical ordering is possible only within subclass.

Bell, Mace, to United Technologies Corp. Housing for motor vehicle diagnostic equipment. B 534,334, 3–16–76, Cl. D26—5.

Forsty, William A., and D. K. Mayer, to Thermo King Corp. Truck body mounted refrigeration unit. B 517,273, 3–16–76, Cl. D23—142.

Gilbert, Paul R. Three wheel automobile. B 434,441, 3–16–75, Cl. D12—85.

Harris, John M. Combined toothbrush holder and bracket. B 479,681, 3–16–76, Cl. D6—94.

Herr, Lewis H., and J. S. Kovacs, to Sperry Rand Corp. A support table for a copying machine. B 401,042, 3–16–76, Cl. D6—177.

Herr, Lewis H., P. W. Proter, and J. S. Kovacs. Electronic calculator. B 500,408, 3–16–76, Cl. D26—5.

Kovacs, John S.: *See*—
Herr, Lewis H.: B 401,042.
Herr, Lewis H., Proter, and Kovacs. B 500,408.

MacMillan, Barbara D. Stringed instrument holder. B 406,546, 3–16–76, Cl. D6—114.

Mayer, Donald K.: *See*—
Forsty, William A., and Mayer. B 517,273.

National Can Corp.: *See*—
Zundel, Arthur P. B 387,337.

Proter, Paul W.: *See*—
Herr, Lewis H., Proter, and Kovacs. B 500,408.

Robinson, Bobby J. Combined stool and tray unit. B 442,163, 3–16–76, Cl. D6—40.

Shaffer, Philip E. Clip-on level for portable electric drills. B 502,381, 3–16–76, Cl. D10—69.

Sperry Rand Corp.: *See*—
Herr, Lewis H., and Kovacs. B 401,042.

Thermo King Corp.: *See*—
Forsty, William A., and Mayer. B 517,273.

United Technologies Corp.: *See*—
Bell, Mace. B 534,334.

Zundel, Arthur P., National Can Corp. End closure for a container. B 387,337, 3–16–76, Cl. D9—255.

CLASSIFICATION OF PUBLISHED DESIGN PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM

DATE PUBLISHED MARCH 16, 1976

CLASS	SUBCLASS	DOCUMENT NO.	PUB. DATE	CLASS	SUBCLASS	DOCUMENT NO.	PUB. DATE
D6–	40	B 442,163	Mar. 16, 1976	D12–	60	B 527,788	Feb. 10, 1976
	94	B 479,681	Mar. 16, 1976		85	B 434,441	Mar. 16, 1976
	114	B 406,546	Mar. 16, 1976	D19–	62	B 561,062	Feb. 10, 1976
	177	B 401,042	Mar. 16, 1976	D23–	142	B 517,273	Mar. 16, 1976
D7–	15	B 424,354	Feb. 10, 1976	D26–	5C	B 487,062	Feb. 10, 1976
	131	B 510,346	Feb. 10, 1976			B 500,408	Mar. 16, 1976
	154	B 414,971	Feb. 10, 1976			B 534,334	Mar. 16, 1976
D9–	71	B 491,906	Feb. 10, 1976	D57–	1F	B 548,462	Feb. 10, 1976
	255	B 387,337	Mar. 16, 1976	D83–	1C	B 532,424	Feb. 10, 1976
D10–	69	B 502,381	Mar. 16, 1976		1N	B 430,287	Feb. 10. 1976

LIST OF DESIGN PATENTEES

AB Bygg-och Transportekonomi (BT) : *See*—
Mono, Rune G. 239,165.

AMF Inc. : *See*—
Meade, Thomas A. 239,150.

Aircraft Mechanics, Inc. : *See*—
Smith, Harry M., and Skinner. 239,148.

American Perma-Cast, Inc. : *See*—
Smith, Harold J. 239,187.

Aquilino, Joseph M., to Davinci Creations, Inc. Accessory for converting brooch to pendant. 239,195, 3–16–76, Cl. D45—1.

Archer, Clifford B. Extrusion head for caulking gun. 239,157, 3–16–76, Cl. D8—14.1.

Ayoub, Raymond : *See*—
Ayoub, Robert, and R. 239,161.

Bednarczuk, Daniel, and A. T. Milton. Pivotal braced protector and knee guard. 239,211, 3–16–76, Cl. D83—1.

Berg, Raymond W. Roller skate. 239,189, 3–16–76, Cl. D34—14.

Berthoud, Fernand. Combination pump and tank for portable sprayer. 239,172, 3–16–76, Cl. D23—2.

Bevilacqua, Ernest M., and A. O. Cholze, to The Perkin-Elmer Corp. Optical projection printer. 239,205, 3–16–76, Cl. D61—1.

Blanchard, Carlton D. Type font. 239,209, 3–16–76, Cl. D64—12.

Bombardier Ltd. : *See*—
Smith, Douglas W., and Lapointe. 239,164.

Borcherding, Norbert R. Bale carrier attachment for tractors. 239,194, 3–16–76, Cl. D40—5.

Burroughs Corp. : *See*—
Jacobson, James W., Clayton, and Sims. 239,208.

Bush, George W., to P.H.C. Industries, Inc. Carrying case handle. 239,158, 3–16–76, Cl. D8—154.

Carroll, James C., to Phillips Petroleum Co. Bakery tray. 239,213, 3–16–76, Cl. D87—1.

Cholze, Alfred O. : *See*—
Bevilacqua, Ernest M., and Cholze. 239,205.

Clayton, Richard G. : *See*—
Jacobson, James W., Clayton, and Sims. 239,208.

Clivio, France : *See*—
Raffler, Dieter, and Clivio. 239,174.

Construction Specialties, Inc. : *See*—
Hallock, Edward C. 239,171.

Container Corp. of America : *See*—
Martin, Roger L. 239,178.

Conwed Corp. : *See*—
Sudheimer, Louis C., and Koenig. 239,169.

Cook, Charles E. Gasoline station fuel dispenser. 239,199, 3–16–76, Cl. D52—2.

Cox, Zula B. Doll. 239,183, 3–16–76, Cl. D34—4.

Cox, Zula B. Doll. 239,184, 3–16–76, Cl. D34—4.

Cox, Zula B. Doll. 239,185. 3–16–76, Cl. D34—4.

Curley, Charles M., to SCM Corp. Control handle for office machines. 239,207, 3–16–76, Cl. D64—11.

Daenen, Robert H.C.M., and P. K. J. De Coster, to Dart Industries, Inc. Flower vase. 239,193, 3–16–76, Cl. D35—3.

Dart Industries, Inc. : *See*—
Daenen, Robert H.C.M., and De Coster. 239,193.

DaVinci Creations, Inc. : *See*—
Aquilino, Joseph M. 239,195.

Dearling, Harry S. Fragrance dispenser. 239,163, 3–16–76, Cl. D23—150.

De Coster, Pieter K.J. : *See*—
Daenen, Robert H.C.M., and De Coster. 239,193.

Derr, Phaon B., III : *See*—
Hoeffel, Gaston D., and Derr. 239,188.

Droll Yankees, Inc. : *See*—
Kilham, Peter. 239,182.

Duni Bila AB : *See*—
Lundin, Arne. 239,151.

Fisher, Thomas G. Shoe. 239,145, 3–16–76, Cl. D2—310.

Gardena Kress + Kastner GmbH : *See*—
Raffler, Dieter, and Clivio. 239,174.

Gavin, Donna L., to Uniroyal, Inc. Article of footwear. 239,146, 3–16–76, Cl. D2—310.

Gerling, Marilyn D. Cup. 239,152, 3–16–76, Cl. D7—6.

Giberstein, Bernard, to Rosy. Display container. 239,160, 3–16–76, Cl. D9—182.

Greenwald, Robert R. Top frame for an aquarium. 239,181 3–16–76, Cl. D30—12.

Haber, Terry M. Telephone lock. 239,179, 3–16–76, Cl. D26—14.

Hallock, Edward C., to Construction Specialties, Inc. Handrail with end piece. 239,171, 3–16–76, Cl. D13—7.

Hansen, Borg, and J. P. Myers. Portable greenhouse. 239,170, 3–16–76, Cl. D13—1.

Harris, Clarence P., Jr. : *See*—
Wiles, Bennie M., and Harris. 239,192.

Hart, Donald G. Vehicle wind deflector. 239,168, 3–16–76, Cl. D12—181.

Hoeffel, Gaston D., and P. B. Derr, III, to Gaston D. Hoffel. Game board. 239,188, 3–16–76, Cl. D34—5.

Holtje, Wilfried, and Prochnow, Claus, to Rollei-Werke Franke & Heidecke. Electronic flash unit. 239,204, 3–16–76, Cl. D61—1.

Hussey, Marianne. Flowerpot holder. 239,149, 3–16–76, Cl. D6—137.

IVAC Corp. : *See*—
O'Leary, Stephen H., and Melton. 239,212.

Interlemo Holding S.A. : *See*—
Mouttet, Leon. 239,175.

Ishihara, Masamitsu. Combined cigarette box and match package. 239,162, 3–16–76, Cl. D9—193.

Jacobson, James W., R. G. Clayton, and J. J. Sims, to Burroughs Corp. Case for a check encoder. 239,208, 3–16–76, Cl. D64—11.

Juy, Lucien C. H. Rear derailleur body. 239,166, 3–16–76, Cl. D12—124.

Karlsen, Ralph N. Self-sticking pocket clip. 239,147, 3–16–76, Cl. D2—428.

Kenco Corp. : *See*—
Leotta, Samuel S. 239,200.

Kent, Jerry R., and W. D. Tank unit for a steam carpet cleaning machine. 239,155, 3–16–76, Cl. D7—166.

Kent, Willie D. : *See*—
Kent, Jerry, and W. D. 239,155.

Kilham, Peter, to Droll Yankees, Inc. Hummingbird feeder. 239,182, 3–16–76, Cl. D30—13.

Kilot, Jules, to Jules Kilot. Tapestry floor loom. 239,214, 3–16–76, Cl. D92—15.

Koenig, Thomas A. : *See*—
Sudheimer, Louis C., and Koenig. 239,169.

Lapointe, Y. Anselme : *See*—
Smith, Douglas W., and Lapointe. 239,164.

Leotta, Samuel S., to Kenco Corp. Envelope opening machine. 239,200, 3–16–76, Cl. D55—1.

Liddle, Floyd K. Refuse prodder. 239,154, 3–16–76, Cl. D7—161.

Lipe, Gordon C. : *See*—
Weinstein, Burton A., and Lipe. 239,190.

Lundin, Arne, to Duni Bila AB. Drinking glass. 239,151, 3–16–76, Cl. D7—6.

Machcinski, Stephen A., III : *See*—
Wilson, Lester E., and Machcinski. 239,176.

Makino, Katsuhiko, to Matsushita Electric Industrial Co., Ltd. Radio receiver. 239,202, 3–16–76, Cl. D56—4.

Marlow, Alfred S. Self-priming centrifugal pump. 239,210, 3–16–76, Cl. D65—1.

Martin, Roger L., to Container Corp. of America. Tree ornament. 239,178, 3–16–76, Cl. D29—1.

Martinet, Roland, to Pneumatiques Caoutchouc Manufacture et Plastiques Kleber Colombes. Tire. 239,167, 3–16–76, Cl. D12—143.

Mary Quant Cosmetics Ltd. : *See*—
Picker, Stanley H. 239,159.
Matsushita Electric Industrial Co., Ltd. : *See*—
Ohta, Kikuo. 239,201.
Makino, Katsuhiko. 239,202.
Yamamura, Masamichi. 239,203.

Mauceri, Robert J., and C. F. Middleton, Jr., to Modicon Corp. Combined programmable controller and power supply therefor. 239,177, 3–16–76, Cl. D26—5.
McDonough, Suellen C. Compartmented wastebasket. 239,156, 3–16–76, Cl. D7—187.
Meade, Thomas A., to AMF Inc. Bowling lane multiple seating unit. 239,150, 3–15–76, Cl. D6—197.
Meissler, Ivan M. Golf putter head. 239,186, 3–16–76, Cl. D34—5.
Melton, Paul J. : *See*—
O'Leary, Stephen H., and Melton. 239,212.
Middleton, Charles F., Jr. : *See*—
Mauceri, Robert J., and Middleton. 239,177.
Milton, Arnold T. : *See*—
Bednarczuk, Daniel, and Milton. 239,211.
Modicon Corp. : *See*—
Mauceri, Robert J., and Middleton. 239,177.
Mono, Rune G., to AB Bygg- och Transportekonomi (BT). Industrial truck. 239,165, 3–16–76, Cl. D12—57.
Mouttet, Leon, to Interlemo Holding S.A. Electric connector. 239,175. 3–16–76, Cl. D26—1.
Myers, John P. : *See*—
Hansen, Borg, and Myers. 239,170.
National Recreation Industries, Inc. :*See*—
Weinstein, Burton A., and Lipe. 239,190.
Nau, Gilbert. Flash light. 239,198, 3–16–76, Cl. D48—24.
Ohta, Kikuo, to Matsushita Electric Industrial Co., Ltd. Clock radio. 239,201, 3–16–76, Cl. D56—4.

O'Leary, Stephen H., and P. J. Melton, to IVAC Corp. Filter for parenteral fluids. 239,212, 3–16–76, Cl. D83—1.
P.H.C. Industries, Inc. : *See*—
Bush, George W. 239,158.
Perkin-Elmer Corp., The : *See*—
Bevilacqua, Ernest M., and Cholze. 239,205.
Phillips Petroleum Co. : *See*—
Carroll, James C. 239,213.
Photo Button Industries, Inc. : *See*—
Valle, Carlos C. 239,206.
Picker, Sanley H., to Mary Quant Cosmetics Ltd. Bottle or the like. 239,159, 3–16–76, Cl. D9—169.
Pneumatiques Caoutchouc Manufacture et Plastiques Kleber Colombes : *See*—
Martinet, Roland. 239,167.
Poston, James T. Lamp. 239,196, 3–16–76, Cl. D48—20.
Prochnow, Claus : *See*—
Holtje, Wilfried, and Prochnow. 239,204.
Raffler, Dieter, and F. Clivio to Gardena Kress + Kastner GmbH. Lawn sprinkler. 239,174, 3–16–76, Cl. D23—7.
Rosy : *See*—
Giberstein, Bernard. 239,160.
Robert, Tony. Aquarium or similar article. 239,180, 3–16–76, Cl. D30—8.
Rollei-Werke Franke & Heidecke : *See*—
Holtje, Wilfried, and Prochnow. 239,204.
SCM Corp. : *See*—
Curley, Charles M. 239,207.
Sims, Jerry J. : *See*—
Jacobson, Clayton, and Sims. 239,208.
Skinner, Clarence J. : *See*—
Smith, Harry M., and Skinner. 239,148.
Smith, Douglas W., and Y. A. Lapointe, to Bombardier Ltd. Snowmobile. 239,164, 3–16–76, Cl. D12—7.
Smith, Harold J., to American Perma-Cast, Inc. Golf club head. 239,187. 3–16–76, Cl. D34—5.
Smith, Harry M., and C. J. Skinner, to Aircraft Mechanics, Inc. Dual railroad passenger seat. 239,148, 3–16–76, Cl. D6—48.
Snyder, Jeffrey. Coaster chest. 239,153, 3–16–76, Cl. D7—45.
Sudheimer, Louis C., and T. A. Koenig, to Conwed Corp. Ceiling runner. 239,169, 3–16–76, Cl. D13—1.
Valle, Carlos C., to Photo Button Industries, Inc. Photo enlarging apparatus. 239,206, 3–16–76, Cl. D61—1.
Weinstein, Burton A., and G. C. Lipe, to National Recreation Industries, Inc. Ski binding. 239,190, 3–16–76, Cl. D34—14.
Weiss, Janet M. Hanging planter. 239,191, 3–16–76, Cl. D35—3.
Wiles, Bennie M., and C. P. Harris, Jr. Hanging planter. 239,-192, 3–16–76, Cl. D35—3.
Wilson, Lester E., and S. A. Machcinski, III. Housing for electrical connectors. 239,176, 3–16–76, Cl. D26—1.
Yamamura, Masamichi, to Matsushita Electric Industrial Co., Ltd. Digital clock radio. 239,203, 3–16–76, Cl. D56—4.
Yoshihara, Norio. Waterfiltering apparatus for use in fish breeding ponds. 239,173, 3–16–76, Cl. D23—4.

CLASSIFICATION OF PATENTS

ISSUED MARCH 16, 1976

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
2.1R 3,943,571
3R 3,943,572
8 3,943,573
9 3,943,574
205 3,943,575

CLASS 3
1 3,943,576

CLASS 4
67R 3,943,577
128 3,943,578
131 3,943,579
172.15 3,943,580
187R 3,943,581
227 3,943,582

CLASS 5
90 3,943,583
299 3,943,584

CLASS 8
34 3,944,382
80 3,944,383
115.5 3,944,384
116.4 3,944,388
128A 3,944,385
177R 3,944,386

CLASS 9
1R 3,943,585
6M 3,943,586

CLASS 10
1A 3,943,587
162R 3,943,588

CLASS 13
6 3,944,713
9ES 3,944,714
27 3,944,715

CLASS 14
72R 3,943,589

CLASS 15
21D 3,943,590
29 3,943,591
160 3,943,592
179 3,943,593
180 3,943,594
250.23 3,943,595
301 3,943,596
331 3,943,597

CLASS 16
93D 3,943,598

CLASS 17
1R 3,943,599
11 3,943,600
32 3,943,601
3,943,602
53 3,943,603

CLASS 19
43 3,943,604
145 3,943,605

CLASS 21
58 3,944,387

CLASS 23
230B 3,944,391
230R 3,944,389
3,944,390
259.5 3,944,392
273SP 3,944,393
288K 3,944,394

CLASS 24
3R 3,943,606
16PB 3,943,607
3,943,608
73HS 3,943,610
73VA 3,943,609
203R 3,943,611

CLASS 26
57E 3,943,612

CLASS 28
76R 3,943,613

CLASS 29
25.35 3,943,614
33P 3,943,615
157R 3,943,616
183.5 3,944,395
196.3 3,944,396
403 3,943,617
407 3,943,618
423 3,943,619
570 3,943,620
578 3,943,621
579 3,943,622
588 3,943,623
603 3,943,624
630C 3,943,625

CLASS 30
100 3,943,626
151 3,943,627

CLASS 32
40R 3,943,628
71 3,943,629

CLASS 33
169R 3,943,630
174G 3,943,631
174L 3,943,632
179.5R 3,943,633
182 3,943,634
264 3,943,635

CLASS 34
44 3,943,636
56 3,943,637
124 3,943,638
155 3,943,639
242 3,943,640

CLASS 35
8R 3,943,641
48R 3,943,642
66 3,943,643

CLASS 37
69 3,943,644

CLASS 40
10D 3,943,645
64R 3,943,646
73.4 3,943,647
106.51 3,943,648
336 3,943,649

CLASS 43
15 3,943,650
42.19 3,943,651
42.74 3,943,652
43.13 3,943,653
43.14 3,943,654
57.5R 3,943,655

CLASS 44
58 3,944,397

CLASS 46
74C 3,943,656
80 3,943,657

CLASS 47
1.2 3,943,658
1.4 3,943,659
1.41 3,943,660
35 3,943,661

CLASS 49
63 3,943,662
370 3,943,663

CLASS 51
5D 3,943,664
101R 3,943,665
106R 3,943,666
112 3,943,667
163V 3,943,668
170MT 3,943,669
307 3,944,398

CLASS 52
23 3,943,670
69 3,943,671
73 3,943,672
98 3,943,673
126 3,943,674
177 3,943,675
309 3,943,676
3,943,677
461 3,943,678
473 3,943,679
481 3,943,680

CLASS 53
35 3,943,681
37 3,943,682
51 3,943,683
66 3,943,684
73 3,943,685
182R 3,943,686
188 3,943,687

CLASS 55
17 3,944,399
21 3,944,400
73 3,944,401
92 3,944,402
294 3,944,404
316 3,944,403
338 3,944,405
407 3,944,406
455 3,944,407

CLASS 56
328R 3,943,688

CLASS 57
34R 3,943,689
58.89 3,943,690
3,943,691
77.45 3,943,692
3,943,693

CLASS 58
19C 3,943,694
23BA 3,943,697
3,943,699
23D 3,943,695
3,943,698
23R 3,943,696
38A 3,943,700
109 3,943,701

CLASS 59
4 3,943,702

CLASS 60
39.16R 3,943,703
39.28T 3,943,704
39.74R 3,943,705
204 3,943,706
229 3,943,707
242 3,943,708
274 3,943,709
288 3,943,710
301 3,943,711
327 3,943,712
395 3,943,713
403 3,943,714
431 3,943,715
444 3,943,716
453 3,943,717
644 3,943,719
676 3,943,718

CLASS 61
.5 3,943,721
1F 3,943,720
36A 3,943,722
45D 3,943,723
46.5 3,943,724
3,943,725

CLASS 62
2 3,943,726
395 3,943,727
507 3,943,728

CLASS 64
30C 3,943,729

CLASS 66
70 3,943,730
86B 3,943,731
123 3,943,732
125R 3,943,733

CLASS 68
5D 3,943,734
5R 3,943,735
133 3,943,736

CLASS 70
106 3,943,737
232 3,943,738
419 3,943,739

CLASS 71
13 3,944,408
90 3,944,409
92 3,944,410
107 3,944,411

CLASS 72
45 3,943,740
57 3,943,741
247 3,943,742
290 3,943,743
326 3,943,744
335 3,943,745
384 3,943,746
388 3,943,747
393 3,943,748

CLASS 73
3 3,943,749
23 3,943,750
27R 3,943,751
41 3,943,752
54 3,943,753
61.4 3,943,754
67.5R 3,943,755
67.8S 3,943,756
78 3,943,757
88.5R 3,943,758
115 3,943,759
119R 3,943,760
144 3,943,761
171 3,943,762
178R 3,943,763
3,943,764
194EM 3,943,765
295 3,943,767
341 3,943,766
396 3,943,768
401 3,943,769
421R 3,943,770
424 3,943,771
429 3,943,772
432A 3,943,773
432R 3,943,774
3,943,775
515 3,943,776

CLASS 74
2 3,943,777
5F 3,943,778
10.33 3,943,779
15.86 3,943,780
18.1 3,943,781
50 3,943,782
89.21 3,943,783
110 3,943,784
242.12 3,943,785
384 3,943,786
410 3,943,787
411 3,943,788
417 3,943,789
3,943,790
471XY 3,943,791
473R 3,943,792
492 3,943,793
501.5R 3,943,794
562.5 3,943,795
577S 3,943,796
594.4 3,943,797
682 3,943,798
866 3,943,799

CLASS 75
10R 3,944,412
35 3,944,413
99 3,944,414
101BE 3,944,415
170 3,944,416

CLASS 81
52.4R 3,943,800
71 3,943,801

CLASS 82
2R 3,943,802
30 3,943,803
33R 3,943,804
49 3,943,806

CLASS 83
23 3,943,805
79 3,943,807
88 3,943,808
311 3,943,809
337 3,943,810

CLASS 84
1.01 3,943,811
3,943,814
1.03 3,943,813
1.1 3,943,812
293 3,943,815
3,943,816

CLASS 85
1S 3,943,817
42 3,943,818
62 3,943,819

CLASS 86
20C 3,943,820

CLASS 89
16 3,943,821

CLASS 90
1.6A 3,943,822

CLASS 91
306 3,943,823
363A 3,943,824
438 3,943,825
488 3,943,826
3,943,827
499 3,943,828

CLASS 92
29 3,943,829
63 3,943,830
86 3,943,831

CLASS 93
1C 3,943,832
35R 3,943,833
44.1GT 3,943,834
77FT 3,943,835

CLASS 96
1R 3,944,417
3,944,418
27R 3,944,419
36 3,944,420
3,944,421
49 3,944,422
91R 3,944,423
110R 3,944,424

CLASS 98
113K 3,943,836

CLASS 99
339 3,943,837
345 3,943,838
407 3,943,839
428 3,943,840
470 3,943,841
473 3,943,842

CLASS 100
51 3,943,843
53 3,943,844
189 3,943,845

CLASS 101
4 3,943,846
114 3,943,847
3,943,848
123 3,943,849
127.1 3,943,850
3,943,851
415.1 3,943,852

CLASS 102
22 3,943,853
34.4 3,943,854
70R 3,943,855
103 3,943,856

CLASS 104
7R 3,943,857
16 3,943,858

CLASS 106
40R 3,944,425
100 3,944,426
208 3,944,427
213 3,944,428

CLASS 108
50 3,943,859
55 3,943,860

CLASS 110
182.5 3,943,861

CLASS 111
2 3,943,863
3 3,943,862

CLASS 112
7 3,943,864
79R 3,943,865
228 3,943,866

CLASS 113
120H 3,943,867

CLASS 114
.5D 3,943,868
16E 3,943,869
20R 3,943,870
66 3,943,871
74R 3,943,872
125 3,943,873
221A 3,943,874
235B 3,943,875

CLASS 115
12R 3,943,876
17 3,943,877
35 3,943,878

CLASS 116
67A 3,943,879
114R 3,943,880
124R 3,943,882
124.1R 3,943,881
3,943,883
137R 3,943,884

CLASS 118
411 3,943,885
637 3,943,886
3,943,887

CLASS 119
14.05 3,943,888
73 3,943,889
95 3,943,890

CLASS 123
8.09 3,943,897
32EA 3,943,891
3,943,892
41.12 3,943,893
54R 3,943,894
58AA 3,943,895
117R 3,943,896
3,943,898
119DB 3,943,899
124R 3,943,900
139AQ 3,943,902
139AS 3,943,901
139AW 3,943,904
139R 3,943,903
148CA 3,943,905
179G 3,943,906
193F 3,943,908
196AB 3,943,909
198DB 3,943,907

CLASS 126
41R 3,943,910
271 3,943,911

CLASS 128
1.3 3,943,912
2B 3,943,916
2F 3,943,917
2P 3,943,915
2S 3,943,913
3,943,914
2.1A 3,943,918
2.1R 3,943,919
11 3,943,920
62R 3,943,921
81R 3,943,922
89R 3,943,923
136 3,943,924
152 3,943,925
218DA 3,943,926
218D 3,943,927
260 3,943,928
275 3,943,929
287 3,943,930
303.1 3,943,931
303.18 3,943,932
317 3,943,934
330 3,943,935
339 3,943,933
419P 3,943,936
3,943,937
421 3,943,938

CLASS 130
27T 3,943,939

CLASS 131
2 3,943,941
10.1 3,943,940
17R 3,943,942
3,943,943
59 3,943,944
140C 3,943,945

CLASS 132
39 3,943,946
73 3,943,947
3,943,948
89 3,943,949

CLASS 133
4A 3,943,950

CLASS 134
99 3,944,429
100 3,943,951

CLASS 135
1R 3,943,952
3E 3,943,953

CLASS 136
30 3,944,430
36 3,944,431
63 3,944,432
83R 3,944,433
86A 3,944,434
111 3,944,435
176 3,944,436
179 3,944,437
202 3,944,438

CLASS 137
13 3,943,954
14 3,943,955
56 3,943,956
85 3,943,957
217 3,943,958
238 3,943,959
268 3,943,960
269 3,943,961
270 3,943,962
283 3,943,963
334 3,943,964
340 3,943,965
344 3,943,966
454.5 3,943,967
493 3,943,968
538 3,943,969
597 3,943,970
610 3,943,971
624.11 3,943,972
624.15 3,943,973
624.27 3,943,974
630.14 3,943,975

CLASS 138
89 3,943,982

CLASS 139
12 3,943,976
166 3,943,977
292 3,943,978
296 3,943,979
384R 3,943,980
391 3,943,981

CLASS 141
192 3,943,983

CLASS 144
34R 3,943,984
134A 3,943,985

CLASS 145
50B 3,943,986

CLASS 148
2 3,944,439
6.3 3,944,440
9R 3,944,441
12F 3,944,442
12.4 3,944,444
16.5 3,944,443
121 3,944,445
131 3,944,446
175 3,944,447

CLASS 149
22 3,944,448

CLASS 150
.5 3,943,987
7 3,943,988
52R 3,943,989

CLASS 152
243 3,943,990

CLASS 156
3 3,944,450
72 3,944,451
3,944,452
143 3,944,453
273 3,944,454
316 3,944,449
361 3,944,455
398 3,944,456
405 3,944,457
412 3,944,458
461 3,944,459
494 3,944,460
538 3,944,461

CLASS 162
31 3,944,462
65 3,944,463
273 3,944,464
336 3,944,465

CLASS 164
21 3,943,991
156 3,943,992
195 Re.28,735

CLASS 165
2 3,943,993
10 3,943,994
101 3,943,995

CLASS 166
293 3,943,996
312 3,943,997

CLASS 172
17 3,943,998
59 3,943,999
3,944,000
311 3,944,001
763 3,944,002

CLASS 173
73 3,944,003

CLASS 174
21R 3,944,716
23C 3,944,717
50 3,944,718
72A 3,944,719
73R 3,944,720
88R 3,944,721
153A 3,944,722

CLASS 176
37 3,944,466
78 3,944,467
81 3,944,468

CLASS 177
121 3,944,004

CLASS 178
3 3,944,723
4.1A 3,944,724
5.8AF 3,944,725
6 3,944,726
6.6A 3,944,728
6.8 3,944,729
3,944,731
7.1 3,944,730
3,944,732
7.2 3,944,737
3,944,738
7.8 3,944,733
7.85 3,944,739
7.91 3,944,734
18 3,944,740
23R 3,944,741
66R 3,944,742

CLASS 179
1FS 3,944,743
1GQ 3,944,735
1VC 3,944,736
1.5R 3,944,744
3,944,745
6.6R 3,944,727
7.1R 3,944,746
15BT 3,944,747
3,944,748
3,944,749
18BH 3,944,750
27CA 3,944,751
81C 3,944,752
84VF 3,944,753
100.4ST 3,944,755
100.4C 3,944,754
111E 3,944,756
115.5H 3,944,757
175 3,944,758
184 3,944,759

CLASS 180
5R 3,944,005
9.62 3,944,006
14R 3,944,007
21 3,944,008
33R 3,944,009
55 3,944,010
70R 3,944,011
77R 3,944,012
3,944,013
79.1 3,944,014
79.2R 3,944,015
82A 3,944,016
89A 3,944,017

CLASS 181
33R 3,944,018
120 3,944,019
141 3,944,020

CLASS 182
3 3,944,021
20 3,944,022
48 3,944,023
194 3,944,024

CLASS 184
3R 3,944,025
7A 3,944,026

CLASS 188
71.9 3,944,027
72.5 3,944,028
282 3,944,029
296 Re.28,736
298 3,944,030
317 3,944,031

CLASS 190
41B 3,944,032
57 3,944,033

CLASS 192
3.25 3,944,034
3.57 3,944,035
109F 3,944,036

CLASS 193
35TE 3,944,037

CLASS 194
1K 3,944,038
4R 3,944,039
65 3,944,040

CLASS 195
1.3 3,944,469
63 3,944,470
103.5R 3,944,471

CLASS 197
7 3,944,042
36 3,944,041
53 3,944,052
72 3,944,043

CLASS 198
16MS 3,944,044
19 3,944,045
21 3,944,046
25 3,944,047
3,944,048
34 3,944,049
37 3,944,050
40 3,944,051
64 3,944,053
118 3,944,054
127R 3,944,055
146 3,944,056
160 3,944,057
179 3,944,058
189 3,944,059
193 3,944,060
204 3,944,061
220BA 3,944,062
255 3,944,063

CLASS 200
6BB 3,944,760
11EA 3,944,761
44 3,944,762
52R 3,944,763
61.27 3,944,765
61.45M 3,944,764
61.58B 3,944,766
61.62 3,944,767
67G 3,944,768
83A 3,944,769
84R 3,944,770
144B 3,944,771
153SC 3,944,772
293 3,944,773
302 3,944,774

CLASS 202
262 3,944,472

CLASS 204
79 3,944,473
87 3,944,474
129.46 3,944,475
140 3,944,476
266 3,944,477
275 3,944,478
297R 3,944,479

CLASS 206
.5 3,944,064
223 3,944,065
268 3,944,066
347 3,944,067
3,944,068
350 3,944,069
386 3,944,070
388 3,944,071
395 3,944,072
427 3,944,074
503 3,944,073

CLASS 208
10 3,944,480
61 3,944,481
120 3,944,482
321 3,944,483

CLASS 209
71 3,944,075
73 3,944,076
3,944,077
3,944,078
409 3,944,484

CLASS 210
24 3,944,485
59 3,944,486
62 3,944,487
108 3,944,488
242R 3,944,489
321A 3,944,490

CLASS 211
5 3,944,079
46 3,944,080

CLASS 212
46B 3,944,081
144 3,944,082

CLASS 214
1D 3,944,083
10.5D 3,944,084
16.1C 3,944,085
17DA 3,944,086
75R 3,944,087
89 3,944,088
131A 3,944,089
152 3,944,090
302 3,944,092
310 3,944,093
390 3,944,094
506 3,944,095
512 3,944,096
514 3,944,097
519 3,944,098
762 3,944,099

CLASS 215
1C 3,944,100
216 3,944,101
251 3,944,102
277 3,944,103
307 3,944,104

CLASS 219
67 3,944,775
73 3,944,776
118 3,944,777
121EM 3,944,779
121P 3,944,778
131WR 3,944,780
137R 3,944,781
152 3,944,782
216 3,944,783
3,944,784
286 3,944,785
453 3,944,786
543 3,944,787

CLASS 220
4E 3,944,105
5A 3,944,106
18 3,944,108
20 3,944,109
23.83 3,944,110
63R 3,944,111
90.2 3,944,112
219 3,944,113
288 3,944,114
326 3,944,107
355 3,944,115

CLASS 222
1 3,944,116
95 3,944,117
134 3,944,118
424 3,944,119

CLASS 226
4 3,944,120
136 3,944,121
198 3,944,122

CLASS 228
223 3,944,123

CLASS 229
1.5B 3,944,124
3.1 3,944,125
4.5 3,944,126
14B 3,944,127
17B 3,944,128
32 3,944,129
37R 3,944,130
40 3,944,131
72 3,944,132

CLASS 233
26 3,944,133

CLASS 234
111 3,944,134

CLASS 235
54F 3,944,788
78M 3,944,789
92PC 3,944,791
92PD 3,944,793
92PK 3,944,792
92SB 3,944,794
92T 3,944,790
144ME 3,944,795
151 3,944,796
151.3 3,944,797
3,944,798
152 3,944,799
153AM 3,944,800
156 3,944,801

CLASS 236
102 3,944,135

CLASS 237
55 3,944,136

CLASS 239
11 3,944,137
18 3,944,138
77 3,944,139
288.5 3,944,141
315 3,944,140
552 3,944,142
650 3,944,143

CLASS 240
2D 3,944,802
6.4W 3,944,803
7.25 3,944,804
10.6R 3,944,806
10.61 3,944,805
11.2R 3,944,807
52R 3,944,808
73R 3,944,809
103R 3,944,810

CLASS 241
22 3,944,144
23 3,944,145
30 3,944,146
60 3,944,147
285A 3,944,091

CLASS 242
47.12 3,944,156
55.53 3,944,148
56R 3,944,149
56.2 3,944,150
58.3 3,944,151
65 3,944,152
68.3 3,944,153
71.2 3,944,154
74 3,944,155
77.1 3,944,157
81 3,944,158
84.2B 3,944,159
84.52C 3,944,160
96 3,944,161
107.4A 3,944,162
3,944,164
107.4R 3,944,163
136 3,944,165
147A 3,944,166

CLASS 244
3.16 3,944,167
3.28 3,944,168
16 3,944,169
44 3,944,170
77A 3,944,171
169 3,944,172

CLASS 246
34CT 3,944,173
163 3,944,174

CLASS 248
59 3,944,175
68R 3,944,176
74A 3,944,177
226D 3,944,178
226R 3,944,179
323 3,944,180
358R 3,944,181

CLASS 249
83 3,944,182

CLASS 250
199 3,944,811
201 3,944,812
205 3,944,813
209 3,944,814
3,944,815
211J 3,944,816
213VT 3,944,817
221 3,944,818
226 3,944,819
227 3,944,820
237G 3,944,821
272 3,944,822
274 3,944,823
282 3,944,825
288 3,944,824
3,944,826
298 3,944,827
302 3,944,828
311 3,944,829
358R 3,944,830
358T 3,944,831
361 3,944,832
362 Re.28,738
367 3,944,833
372 3,944,834
487 3,944,835
505 3,944,836
515 3,944,838

CLASS 252
45 3,944,491
50 3,944,492
62.1P 3,944,493
68 3,944,494
75 3,944,495
79.3 3,944,496
96 3,944,497
106 3,944,498
167 3,944,499
182 3,944,500
3,944,501
316 3,944,502
455R 3,944,503
3,944,504
466B 3,944,505
526 3,944,506

CLASS 254
104 3,944,183
134.3R 3,944,184
175.5 3,944,185
191 3,944,186

CLASS 256
13.1 3,944,187

CLASS 259
54 3,944,188
89 3,944,189
177R 3,944,190
191 3,944,191
3,944,192

CLASS 260
2.1R 3,944,507
2.5R 3,944,508
19UA 3,944,510
23H 3,944,511
23.7R 3,944,512
29.6PT 3,944,513
38 3,944,514
3,944,515
40R 3,944,516
45.75C 3,944,518
46.5UA 3,944,519
46.5R 3,944,520
47CP 3,944,517
3,944,522
47UA 3,944,521
62 3,944,523
78UA 3,944,525
79.3M 3,944,526
79.7 3,944,527
83.7 3,944,528
88.2R 3,944,529
88.25 3,944,530
89.3 3,944,532
93.1 3,944,533
93.7 3,944,534
94.3 3,944,535
94.9R 3,944,536
112G 3,944,537
112.5R 3,944,538
139 3,944,539
186 3,944,540
210.5 3,944,541
239.3A 3,944,543
239.3B 3,944,579
239.3 3,944,542
243C 3,944,544
3,944,545
3,944,546
3,944,580
248CS 3,944,547
248A 3,944,548
251R 3,944,581
256.4N 3,944,549
260 3,944,550
268BC 3,944,551
3,944,552
285.5 3,944,582
287AR 3,944,555
287B 3,944,554
287P 3,944,553
288CE 3,944,556
293.69 3,944,524
294.9 3,944,557
297R 3,944,558
297Z 3,944,559
302H 3,944,560
306.7R 3,944,561
307F 3,944,562
310R 3,944,563
314.5 3,944,564
315 3,944,565
328 3,944,566
332.5 3,944,567
340.9 3,944,509
3,944,568
343.3R 3,944,569
343.4 3,944,570
3,944,583
343.6 3,944,571
3,944,572
347.3 3,944,573
349 3,944,574
395 3,944,575
397.1 3,944,577
3,944,578
397.3 3,944,584
397.5 3,944,576
410.7 Re.28,737
428.5 3,944,585
429R 3,944,586
448.8R 3,944,587
449L 3,944,588
463 3,944,590
465F 3,944,591
465K 3,944,589
465.3 3,944,592
468D 3,944,593
473A 3,944,595

473S 3,944,594
3,944,596
488F 3,944,597
501.1 3,944,598
502.4P 3,944,599
515A 3,944,600
524R 3,944,601
525 3,944,602
533AN 3,944,603
533A 3,944,604
535P 3,944,606
555A 3,944,605
558A 3,944,607
561HL 3,944,608
3,944,610
561N 3,944,609
562R 3,944,611
573 3,944,612
576 3,944,613
578 3,944,614
580 3,944,615
584R 3,944,616
3,944,617
3,944,618
3,944,619
586G 3,944,621
58CP 3,944,620
593R 3,944,622
600R 3,944,531
603HF 3,944,623
611B 3,944,624
637R 3,944,625
666M 3,944,626
668R 3,944,627
674N 3,944,628
857PE 3,944,629
879 3,944,630
881 3,944,631
926 3,944,632
927R 3,944,633

CLASS 261
41D 3,944,634
62 3,944,635
159 3,944,636

CLASS 264
.5 3,944,638
1 3,944,637
13 3,944,639
25 3,944,640
70 3,944,641
89 3,944,642
97 3,944,643
146 3,944,644
237 3,944,645

CLASS 266
1R 3,944,193
23E 3,944,194
34A 3,944,195

CLASS 267
4 3,944,196
64R 3,944,197
116 3,944,198

CLASS 269
15 3,944,199
42 3,944,200
130 3,944,202
296 3,944,203
323 3,944,204
328 3,944,205

CLASS 270
52.5 3,944,206
58 3,944,207
61F 3,944,208

CLASS 271
4 3,944,209
3,944,210
8R 3,944,211
9 3,944,212
10 3,944,213
3,944,214
22 3,944,215
157 3,944,216
173 3,944,217
277 3,944,218

CLASS 272
60R 3,944,654
62 3,944,219
67 3,944,220
79C 3,944,221

CLASS 273
1B 3,944,223
1M 3,944,222
12 3,944,224
26B 3,944,225
84 3,944,226
102.4 3,944,227
128CS 3,944,228
134AE 3,944,229
149R 3,944,230
162E 3,944,231
176FB 3,944,232
186R 3,944,233

CLASS 274
9B 3,944,234

CLASS 277
22 3,944,235
224 3,944,236

CLASS 280
11.13E 3,944,239
11.35C 3,944,238
11.35K 3,944,237
11.35T 3,944,240
30 3,944,241
3,944,242
63 3,944,243
87R 3,944,244
106.5R 3,944,245
112A 3,944,246
124B 3,944,248
124R 3,944,247
150AB 3,944,249
3,944,250
3,944,251
150E 3,944,252
238 3,944,253
276 3,944,254
289 3,944,255
402 3,944,256
404 3,944,257
408 3,944,258
475 3,944,259

CLASS 285
15 3,944,260
21 3,944,261
53 3,944,262
96 3,944,263
137R 3,944,264
419 3,944,265

CLASS 290
40R 3,944,837
55 3,944,839
3,944,840

CLASS 292
145 3,944,266
158 3,944,267
264 3,944,268
322 3,944,269

CLASS 293
70 3,944,270
71R 3,944,271

CLASS 294
81SF 3,944,272
86.1 3,944,273
88 3,944,274

CLASS 296
28M 3,944,275
63 3,944,201
65R 3,944,276
68 3,944,277
146 3,944,278

CLASS 297
217 3,944,279
239 3,944,280
440 3,944,281
3,944,282
454 3,944,283

CLASS 298
14 3,944,284

CLASS 301
9DN 3,944,285

CLASS 303
13 3,944,286
15 3,944,287
21AF 3,944,288
21BE 3,944,289
21A 3,944,291
21F 3,944,290
24C 3,944,292
24F 3,944,293
40 3,944,294
89 3,944,295

CLASS 305
35R 3,944,296
57 3,944,297

CLASS 307
38 3,944,841
88LC 3,944,842
116 3,944,843
3,944,844
118 3,944,845
129 3,944,846
131 3,944,847
205 3,944,848
221D 3,944,849
3,944,850
223R 3,944,851
229 3,944,852
237 3,944,853
240 3,944,856
269 3,944,858
308 3,944,859
311 3,944,854
3,944,860
3,944,861

CLASS 308
3CH 3,944,299
4R 3,944,300
5R 3,944,301
6A 3,944,303
6R 3,944,302
9 3,944,304
137 3,944,298
187.1 3,944,305
3,944,306
217 3,944,307

CLASS 310
9.8 3,944,862
69 3,944,855
168 3,944,863
3,944,864
178 3,944,865
266 3,944,857

CLASS 312
111 3,944,308
198 3,944,309
263 3,944,310

CLASS 313
346R 3,944,866
403 3,944,867
517 3,944,868
519 3,944,869

CLASS 315
8 3,944,870
30 3,944,871
39.51 3,944,872
111.8 3,944,873
169TV 3,944,874
3,944,875
205 3,944,876
241P 3,944,877
316 3,944,878
370 3,944,879
380 3,944,880
398 3,944,881
3,944,882
399 3,944,883
400 3,944,884

CLASS 317
9R 3,944,885
12A 3,944,886
16 3,944,887
18D 3,944,888
31 3,944,889
36TD 3,944,890
48 3,944,891
120 3,944,892
148.5R 3,944,893
232 3,944,894
258 3,944,895

CLASS 318
85 3,944,896
139 3,944,897
258 3,944,898
269 3,944,899
317 3,944,900
318 3,944,901
593 3,944,902
606 3,944,903

CLASS 320
23 3,944,904
48 3,944,905

CLASS 321
8R 3,944,906
13 3,944,907
15 3,944,908

CLASS 323
43.5S 3,944,913
45 3,944,909

CLASS 324
6 3,944,910
37 3,944,911
41 3,944,912
51 3,944,914
3,944,915
65P 3,944,916
71CP 3,944,917
94 3,944,918
107 3,944,919
111 3,944,920
133 3,944,921
158P 3,944,922
165 3,944,923

CLASS 325
16 3,944,924
17 3,944,925
38A 3,944,927
38R 3,944,926
55 Re.28,739
65 3,944,928
363 3,944,929
364 3,944,930
423 3,944,931
427 3,944,932

CLASS 328
5 3,944,933
119 3,944,934
140 3,944,935
150 3,944,936
167 3,944,937

CLASS 329
50 3,944,938
104 3,944,939
122 3,944,940

CLASS 330
51 3,944,941
86 3,944,942
109 3,944,943
149 3,944,944

CLASS 331
78 3,944,945
94 3,944,946
94.5D 3,944,947

CLASS 332
7.51 3,944,948
14 3,944,949

CLASS 333
31R 3,944,950
72 3,944,951

CLASS 334
39 3,944,952

CLASS 335
23 3,944,953
35 3,944,954
61 3,944,955
112 3,944,956
174 3,944,957

CLASS 336
136 3,944,958

CLASS 337
82 3,944,959
329 3,944,961
408 3,944,960

CLASS 338
126 3,944,962

CLASS 339
45M 3,944,311
59R 3,944,312
75MP 3,944,313
95R 3,944,315
95 3,944,314
111 3,944,316
143R 3,944,317
231 3,944,318
269 3,944,319

CLASS 340
1R 3,944,963
2 3,944,964
3R 3,944,965
5C 3,944,966
6R 3,944,967
27AT 3,944,968
52E 3,944,970
52F 3,944,969
58 3,944,971
74 3,944,972
146.1AB 3,944,975
146.1AL 3,944,973
146.1BE 3,944,974
146.2 3,944,976
146.3AG 3,944,977
3,944,979
146.3E 3,944,978
147P 3,944,980
147R 3,944,981
171R 3,944,982
172.5 3,944,983
3,944,984
3,944,985
3,944,986
3,944,987
3,944,988
3,944,989
173RC 3,944,990
174TF 3,944,991
174YC 3,944,992
244R 3,944,994
253A 3,944,995
282 3,944,996
324AD 3,944,993
3,944,997
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3,944,999
336 3,945,000
3,945,001
347DD 3,945,002
377 3,945,003
384E 3,945,004

CLASS 343
5PD 3,945,005
6R 3,945,006
3,945,007
7PF 3,945,008
7.7 3,945,009
17.2PC 3,945,010
3,945,011
17.2R 3,945,012
708 3,945,013
713 3,945,014
765 3,945,015
895 3,945,016

CLASS 346
33TP 3,945,017
44 3,945,018
74ES 3,945,019
75 3,945,020
3,945,021
3,945,022

CLASS 350
1 3,944,320
3.5 3,944,321
3,944,322
7 3,944,323
16 3,944,324
3,944,325
96WG 3,944,326
96C 3,944,327
3,944,328
151 3,944,329
160LC 3,944,330
3,944,331
3,944,332
160R 3,944,333
161 3,944,334
3,944,335
174 3,944,336
189 3,944,337
220 3,944,338
3,944,339
255 3,944,340

CLASS 351
7 3,944,341
14 3,944,342
16 3,944,343
41 3,944,344
43 3,944,345
49 3,944,346
160 3,944,347

CLASS 352
5 3,944,348
184 3,944,349

CLASS 353
27R 3,944,350
31 3,944,351
55 3,944,352

CLASS 354
25 3,945,023
29 3,945,024
3,945,025
147 3,945,026
250 3,945,027

CLASS 355
3P 3,944,353
3R 3,944,354
3,944,355
3,944,356
5 3,944,357
9 3,944,358
14 3,944,359
3,944,360
27 3,944,361
38 3,944,362
60 3,944,363
74 3,944,364
75 3,944,365
76 3,944,366
3,944,367

CLASS 356
30 3,944,368
167 3,944,369
226 3,944,370

CLASS 357
13 3,945,028
14 3,945,029
23 3,945,031
40 3,945,032
52 3,945,030

CLASS 358
26 3,945,033
50 3,945,034

CLASS 360
7 3,945,035
71 3,945,036
77 3,945,037
113 3,945,038
137 3,945,039
3,945,040

CLASS 401
110 3,944,371
244 3,944,372

CLASS 402
1 3,944,373
33 3,944,374

CLASS 403
13 3,944,375
132 3,944,376
189 3,944,377

CLASS 408
79 3,944,379

CLASS 415
1 3,944,380

CLASS 417
564 3,944,381

CLASS 418
60 3,944,378

CLASS 423
72 3,944,647
121 3,944,648
219 3,944,646
242 3,944,649
3,944,650
279 3,944,651
379 3,944,656
491 3,944,653
541A 3,944,657
626 3,944,658

CLASS 424
1 3,944,659
44 3,944,660
49 3,944,661
78 3,944,662
3,944,663
93 3,944,664
101 3,944,665
219 3,944,666
227 3,944,668
232 3,944,669
244 3,944,667
250 3,944,670
267 3,944,671
274 3,944,672
283 3,944,673
300 3,944,674
324 3,944,675
345 3,944,652

CLASS 426
32 3,944,655
46 3,944,676
432 3,944,677
508 3,944,678
538 3,944,679
564 3,944,680
615 3,944,681

CLASS 427
34 3,944,683
74 3,944,682
109 3,944,684
223 3,944,685
228 3,944,686
288 3,944,701
372 3,944,687
381 3,944,688
385 3,944,689
390 3,944,690

CLASS 428
13 3,944,691
40 3,944,692
89 3,944,693
131 3,944,694
200 3,944,695
208 3,944,696
210 3,944,697
219 3,944,698
220 3,944,699
260 3,944,700
288 3,944,702
3,944,703
305 3,944,704
331 3,944,705
383 3,944,706
391 3,944,707
400 3,944,708
409 3,944,709
412 3,944,710
3,944,711
418 3,944,712

CLASSIFICATION OF DESIGNS

D2—	310	239,145
		239,146
	428	239,147
D6—	48	239,148
	137	239,149
	197	239,150
D7—	6	239,151
		239,152
	45	239,153
	161	239,154
	166	239,155
	187	239,156
D8—	14.1	239,157
	154	239,158
D9—	169	239,159
	182	239,160
	184	239,161
	193	239,162
D12—	7	239,164
	57	239,165
	124	239,166
	143	239,167
	181	239,168
D13—	1H	239,169
	R	239,170
	7	239,171
D23—	2	239,172
	4	239,173
	7	239,174
	150	239,163
D26—	1A	239,175
		239,176
	5C	239,177
	14A	239,179
D29—	1	239,178
D30—	8	239,180
	12	239,181
	13	239,182
D34—	4R	239,183
		239,184
		239,185
	5GH	239,186
		239,187
	SS	239,188
	14C	239,189
	D	239,190
D35—	3A	239,191
		239,192
	R	239,193
D40—	5	239,194
D45—	1R	239,195
D48—	20	239,196
		239,197
	24A	239,198
D52—	2	239,199
D55—	1R	239,200
D56—	4B	239,201
		239,202
		239,203
D61—	1F	239,204
	Q	239,205
		239,206
D64—	11B	239,207
	C	239,208
	12B	239,209
D65—	1R	239,210
D83—		239,212
	.004	239,211
D87—	R	239,213
D92—	15	239,214

CLASSIFICATION OF PLANTS

P. —	8	3,844
P. —	11	3,845
P. —	68	3,841
P. —		3,843
P. —	88	3,842

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,943,599	3,943,980	3,944,380	3,945,037	3,944,138	3,944,219
3,944,095	3,943,985	3,944,400	9 : 3,943,630	3,944,159	3,944,224
3,944,137	3,943,988	3,944,415	3,943,645	3,944,230	3,944,231
3,944,691	3,944,001	3,944,426	3,943,766	3,944,443	3,944,249
4 : 3,943,626	3,944,012	3,944,452	3,943,943	3,944,670	3,944,260
3,943,699	3,944,021	3,944,455	3,944,067	3,944,733	3,944,267
3,943,760	3,944,027	3,944,485	3,944,072	3,944,793	3,944,288
3,943,915	3,944,032	3,944,506	3,944,101	3,944,797	3,944,297
3,944,098	3,944,047	3,944,537	3,944,188	3,944,917	3,944,318
3,944,222	3,944,052	3,944,553	3,944,215	3,944,977	3,944,338
3,944,256	3,944,064	3,944,607	3,944,239	13 : 3,943,646	3,944,374
3,944,362	3,944,069	3,944,653	3,944,382	3,943,748	3,944,375
3,944,925	3,944,077	3,944,662	3,944,439	3,943,754	3,944,409
5 : 3,943,967	3,944,084	3,944,685	3,944,449	3,943,773	3,944,410
3,944,111	3,944,086	3,944,721	3,944,464	3,943,864	3,944,444
6 : 3,943,580	3,944,096	3,944,727	3,944,492	3,943,865	3,944,460
3,943,581	3,944,117	3,944,728	3,944,524	3,944,097	3,944,461
3,943,584	3,944,133	3,944,732	3,944,528	3,944,148	3,944,601
3,943,585	3,944,139	3,944,743	3,944,608	16 : 3,944,285	3,944,655
3,943,642	3,944,140	3,944,782	3,944,609	17 : Re.28,735	3,944,698
3,943,648	3,944,147	3,944,788	3,944,617	3,943,575	3,944,706
3,943,654	3,944,153	3,944,798	3,944,618	3,943,609	3,944,712
3,943,655	3,944,162	3,944,820	3,944,619	3,943,637	3,944,747
3,943,666	3,944,165	3,944,834	3,944,624	3,943,663	3,944,763
3,943,668	3,944,173	3,944,839	3,944,631	3,943,680	3,944,768
3,943,673	3,944,179	3,944,846	3,944,791	3,943,685	3,944,784
3,943,677	3,944,181	3,944,853	3,944,792	3,943,717	3,944,799
3,943,708	3,944,185	3,944,876	3,944,805	3,943,729	3,944,828
3,943,714	3,944,187	3,944,914	3,944,891	3,943,782	3,944,847
3,943,750	3,944,190	3,944,915	3,944,909	3,943,791	3,944,848
3,943,770	3,944,201	3,944,924	3,944,910	3,943,793	3,944,867
3,943,775	3,944,234	3,944,940	3,944,964	3,943,825	3,944,878
3,943,778	3,944,242	3,944,945	3,944,966	3,943,860	3,944,884
3,943,807	3,944,246	3,944,949	10 : Re.28,736	3,943,918	3,944,892
3,943,816	3,944,247	3,944,967	3,943,838	3,943,929	3,944,906
3,943,836	3,944,251	3,944,971	3,944,071	3,943,930	3,944,933
3,943,852	3,944,257	3,944,974	3,944,347	3,943,963	18 : 3,943,670
3,943,868	3,944,258	3,944,976	3,944,494	3,944,035	3,943,785
3,943,877	3,944,259	3,944,978	3,944,536	3,944,045	3,943,811
3,943,890	3,944,268	3,944,979	3,944,586	3,944,073	3,943,904
3,943,909	3,944,273	3,944,990	11 : 3,943,592	3,944,074	3,943,913
3,943,911	3,944,283	3,945,012	3,945,006	3,944,113	3,944,046
3,943,916	3,944,284	3,945,030	12 : 3,943,688	3,944,121	3,944,150
3,943,920	3,944,306	3,945,036	3,943,795	3,944,129	3,944,245
3,943,925	3,944,310	8 : 3,944,079	3,943,840	3,944,132	3,944,545
3,943,932	3,944,317	3,944,575	3,943,874	3,944,141	3,944,554
3,943,934	3,944,319	3,944,599	3,943,876	3,944,174	3,944,673
3,943,935	3,944,323	3,944,683	3,943,910	3,944,176	3,944,731
3,943,94[illegible]	3,944,325	3,944,750	3,943,951	3,944,196	3,944,883
3,943,959	3,944,364	3,944,885	3,943,969	3,944,206	3,944,952
3,943,968	3,944,377	3,945,023	3,944,039	3,944,211	3,945,003

19 : 3,943,636
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3,943,958
3,944,082
3,944,953
20 : 3,944,344
3,944,761
21 : 3,943,832
3,944,026
3,944,312
3,944,870
22 : 3,943,571
3,943,839
3,943,974
3,943,997
3,944,065
23 : 3,943,762
24 : 3,943,598
3,943,674
3,943,879
3,943,987
3,944,342
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3,944,480
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3,944,918
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3,944,997
25 : 3,943,616
3,943,628
3,943,720
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3,944,167
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3,944,322
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3,944,888
3,944,946
3,944,947
3,944,951
3,944,960
3,944,970
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26 : 3,943,588
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3,943,800
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3,943,844
3,943,894
3,943,896
3,944,017
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3,944,080
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3,944,202
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		239,170			239,214	19	:	239,194			239,169
		239,178	8	:	239,148	22	:	239,183	32	:	239,206
		239,179	9	:	239,146			239,184	33	:	239,156
		239,181			239,205			239,185	34	:	239,158
		239,189			239,209						

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PLANT PATENTS

6	:	3,842			3,844	39	:	3,841			

U. S. GOVERNMENT PRINTING OFFICE : O - 1976

U.S. DEPARTMENT OF COMMERCE
Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, Commissioner